Electricity on the Farm

A Monthly Magazine for the Progressive Rural Family

JULY 1931

MERCHANDISING EDITION

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reveals secret of

Cool Farm Kitchens

with General Electric Hotpoint Ranges

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JUST imagine cooking meals, on hot days, in an oven as cool as a kitchen table! Imagine a range cooking surface so cool that you can place your hand on the cool porcelain when food is steaming in saucepans!

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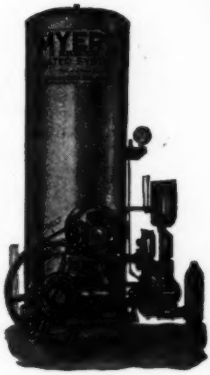

Fig. 2510

A complete Water System Unit for wells up to 22 feet in depth, with 42 gallon pressure tank. Entirely automatic in action — self-starting, self-stopping, self-oiling. Capacity 250 gallons per hour.

Electricity on the Farm

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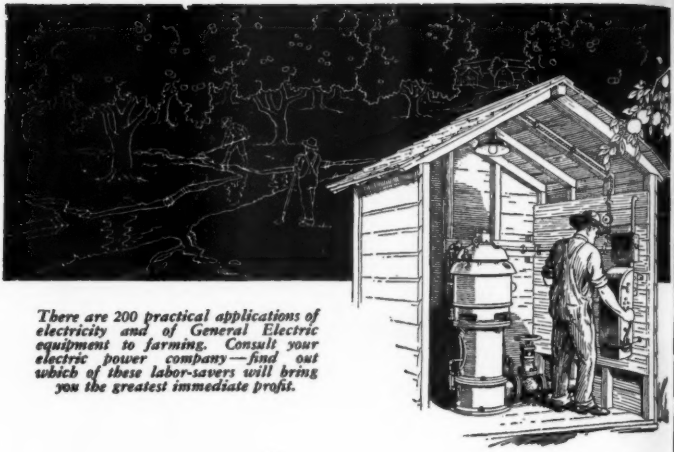

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GENERAL ELECTRIC

ELECTRICITY ON THE FARM

JULY, 1931

Kitchen Comfort

"Come, summer, the sweet season and the sun," may have been the way King James I, of Scotland, felt about it, but the farm housewife, who has to cook three meals a day over a coal or wood stove in a hot kitchen, probably has a different story to tell. The kitchen may be comfortable in winter, but when hot summer days arrive, it's not so popular.

To make matters worse, the summer work day is longer, there are usually more people to feed, and with better appetites, and then there are outside chores which impose an additional burden on the women folks. All in all, summer is not such a "sweet season" where the cooking equipment is old fashioned.

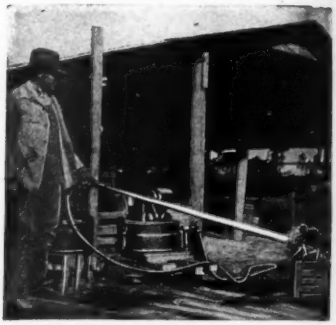
But those farm homes which have central station electric service, commonly known as "high line" service, are in a position to give the home maker a better break. Modern electric ranges are built to fit admirably the needs of the farm. They confine their heat to those things being cooked, and cause no appreciable heating of the kitchen. They cook quickly. They are automatic in operation, maintaining uniform temperatures in the oven, and shutting off the current automatically when the dinner is done.

Probably no other electrical appliance contributes as much to the comfort, the happiness and health of the farm housewife as does the range. It is but one of the many blessings made possible in the modern farm home by the advent of electricity.

Electricity on the farm

Some Ideas Which Have INCREASED PROFITS For a Truck Farmer

By S. R. GIBBONS



Washing vegetables for market by use of electric pump.

MR. C. C. QUIGGLE, a progressive truck farmer near Mobile, Ala., has put electricity to work in an effective and profitable way on his truck farm.

He had been losing about 30% to 40% of his tomato crop every year due to infestation by the tomato worm. Since the moth that lays these eggs is a night-flying insect and attracted by light, Mr. Quiggle installed a simple lighting system consisting of five 100-watt lamps five feet above the ground and equally divided over each acre of tomatoes. A pan of kerosene and water was suspended immediately under each lamp and reflectors were used in order to concentrate the light over the pan. The moths are attracted to the lights and are trapped in the pan of oil and water. Mr. Quiggle states that infestation has been reduced to less than one per cent. This system has been used for three seasons at his farm, resulting in a conservatively estimated saving at 2,000 pounds of tomatoes per acre per year, or $200, tomatoes being marketed at an average of 10c per pound. The lights were used all of each night from the time the tomato plants were set until the tomatoes were harvested. The electricity consumed in this operation amounted to only about 300 KWH per acre per year, and the cost was a very small item compared to the saving of tomatoes and the increased income to Mr. Quiggle.

Infestation by tomato worm eliminated by light trap.

In order to hasten the growth of the plants to the proper size for transplanting into the field and thereby to bring them into bearing at an earlier date, Mr.

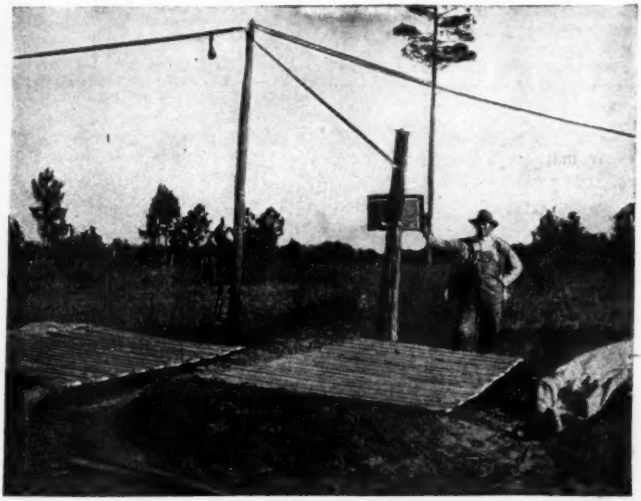
Quiggle is using this season a home-made electric hotbed. The hotbed can be put into operation at any time simply by turning a switch, and uniformed heat is easily obtained during the germinating period. The construction is very simple Mr. Quiggle converted a 4 foot by 16 foot cement frame, in which manure had been used for supplying heat for germination, into an electric hotbed by substituting small electrical units for the manure. There are four 115-volt units, two 250-watts and two 150-watts, or a total of 800 watts, equally distributed over the base of the frame. To protect these units from water, a sheet of galvanized iron was placed just above them and the soil placed on flats above this. This construction insured a uniform distribution of heat throughout the bed.

The electric hotbed is proving much more satisfactory than the manure type, in that it is more convenient, more dependable, and the temperature can be controlled. A further reason for using electricity is that manure is becoming more and more difficult to obtain. Mr. Quiggle is the first truck farmer near Mobile to adopt such a method and is well pleased with its efficiency. He produces and markets general truck crops such as peppers, tomatoes, carrots, turnips, spinach, and beans.

Washes Vegetables Thoroughly

The most desirable products naturally sell first and at a higher price than do the less desirable; therefore, obtaining force from an electric pump, Mr. Quiggle washes his vegetables thoroughly before taking them to market. This he finds to be a very effective and cheap process.

Electricity is equally as convenient in the home as on the farm itself. The Quiggle home is equipped with electric stove, refrigerator, running water supplied from the electric water system, and other modern conveniences, and Mrs. Quiggle states that they are things that she would not do without. The family is enjoying the conveniences and comforts through the use of the electrical equipment in the home, and the use of elec-



Mr. Quiggle Turning on Switch to Electric Hotbed.

tricity in connection with the farm operations is increasing the net income considerably more than enough to pay the entire cost of electric service.

Further Extension of Service Being Studied

Mr. Quiggle is interested in making further uses of this convenient source of power in connection with his farming and is now studying the possibility of irrigating his truck farm to increase production and to remove the risk of crop failures from dry weather.

A Motor for the Pea Viner

By P. K. Kilpatrick

Motors are proving a cheap source of power for operating pea viners. They save the cost of a tractor operator and furnish a steady, quiet power.

The illustration shows a motor-driven pea viner set up on the Hugh McMahn farm, south of Rochester, Indiana. This machine ran 110 hours and used 500 kilowatt-hours. This means 4½ KWH per hour. For this man it cost about one-half the cost of operating a tractor.

Any man who has peas to vine can well afford to investigate using a motor for this new use.

Milking Cows in Comfort

Did you ever sit down to milk a cow when the perspiration dripped from your body and the flies seemed to eat up the cow?

This condition can be changed so that the cow stands contentedly eating her feed, and the milker works in comfort. An inexpensive electric fan directed towards the milker and cow will solve this need, and will provide comfort for both milker and cow.

The fan may be placed on a shelf or hung from the little carrier track. It will prove to be one of the most appreciated uses for electricity on the farm.

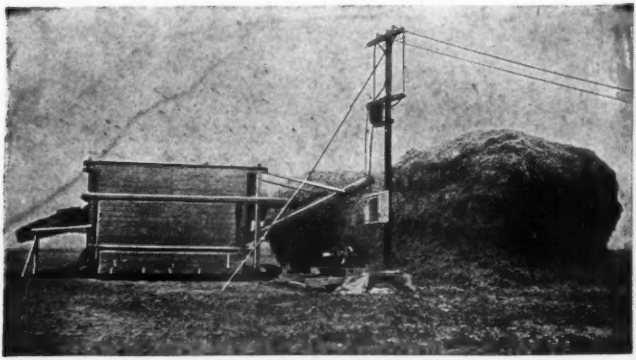
Reducing the Harvest Crew

Farmers who have portable or inside cup elevators for their cribs and granary usually are able to eliminate two men from the threshing crew and remove the drudgery from what was one of the hardest jobs in connection with the harvest.

Extra Large Baggage

Conductor (after stumbling over obstacle in the aisle): "Madam you must not leave your valise in the aisle."

Colored Lady: "Foh de land sakes, dat ain't no valise; dat's my foot!"



A motor driven pea viner on the Hugh McMahn farm south of Rochester, Indiana, has reduced operating costs for its owner.

CANNING IS FUN

By GRACE VIALL GRAY

Secretary International Canning Contest*

Mrs. Alice Bell of Eaton Rapids, Michigan, was Declared the Grand Champion Canner of 1930.

I CALLED on my neighbor, Alice Rand, just the other day and found her busy canning and planning to can vegetables and other fruits in season. She cans for various reasons. First of all, she likes to can, and who wouldn't, with a lovely white enameled electric range and a shiny new pressure cooker. It was easy to see that she was proud of her products as she showed them to me and she had just reason to be. Each jar shows that she had been very careful in preparing the fruit and in the pack. The second reason why she likes to can and is so particular about how each jar looks, is because she is ambitious to be the Grand Champion Canner of the United States for 1931 when the canning contest at Aurora, Illinois, closes October 1st.

She read all about Mrs. Alice Bell of Eaton Rapids, Michigan, winning $500 on her grand champion jar of Cuthbert raspberries in the 1930 canning contest, and so with this dream before her she goes about her canning.

All Alices everywhere are grateful to a changing world that has made canning a joy and a pleasure instead of something to be dreaded. We homemakers lift up our voices in one grand song, singing the praises of electric ranges, pressure cookers, reliable rubber rings and the modern "hot-pack" method of canning.

What's New in Canning

My friend Alice says: "There are styles in foods as there are styles in clothes. Both change from year to year. What we women wore yesterday we will not wear today."

And so it is with cooking and canning. When we think of our grandmothers' loaded tables with several protein foods served in the same course, followed by pie and cake and possibly doughnuts, we realize we have come a long way in food styles. It is stylish to serve one protein, one fresh vegetable, one starchy vegetable and a balanced desert. Simplicity in clothes and foods is stylish today.

"I like to can," she says, "because canning is now so simple and easy. Simplicity in canning has come to our rescue. When I

*Past President, First Dist. Illinois Federation of Women's Clubs, Author of "Every Step in Canning."

think how my mother canned in a hot steaming kitchen, burning her hands with hot jars and hot juices, is it any wonder that she dreaded the canning season almost as much as we do the orgy of house-cleaning?"

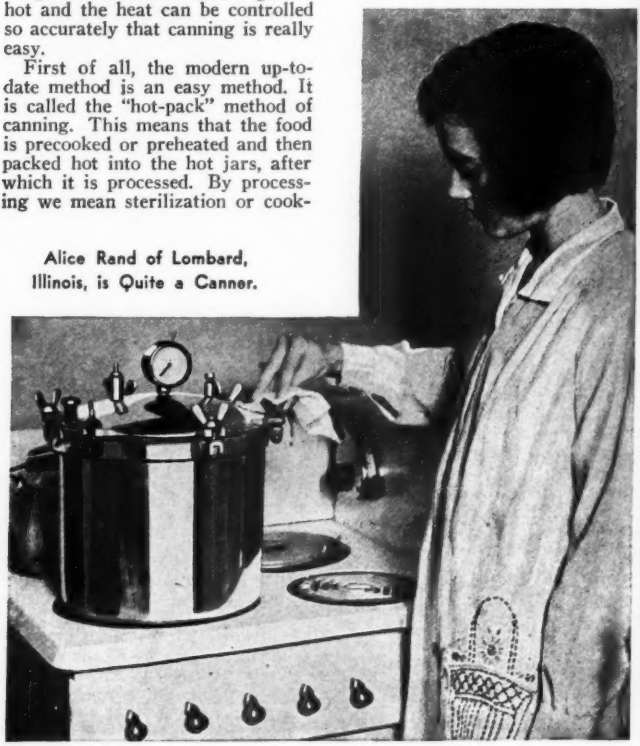
Canning Really Easy

But times have changed for the better for us busy women-folks who have to can during the hot summer months, just when we are the busiest. There are the threshers to prepare for, there's the garden, the chickens, and summer guests, besides the regular every-day housekeeping, so anything that cuts the working time and lessens the heat is a godsend to us women. With the electric range the kitchen doesn't get so hot and the heat can be controlled so accurately that canning is really easy.

First of all, the modern up-to-date method is an easy method. It is called the "hot-pack" method of canning. This means that the food is precooked or preheated and then packed hot into the hot jars, after which it is processed. By processing we mean sterilization or cooking a product for a certain length of time.

The product must be cooked long enough to kill or render inactive bacteria, germs and spores while retaining the food qualities of the product.

The outstanding feature of modern canning is the fact that the product is cooked in the jar. After years of experimenting, it is a foregone conclusion that cooking the product in a closed jar is the most successful method of canning vegetables, fruits and meats. It is a safer, easier way of canning most foods than the cook-in-the-open-kettle method. The product also keeps its natural shape and flavor better. For these reasons home makers have gradually



Alice Rand of Lombard, Illinois, is Quite a Canner.

adopted this method, used by all canning factories.

The word "pre-heat" has more or less replaced the word "blanch." By pre-heating it means bringing a product to the boiling point, or close to the boiling temperature, before packing in the jar. Vegetables are preheated in salted water, some fruits are preheated in syrup, while greens are steamed in order to have mineral and vitamin values.

Advantages of Preheating

You may say: "But why preheat? What are the advantages?" The advantages are many. Preheating drives the air from the product; it shrivels products as greens and string beans, making it possible to get a fuller pack; it softens vegetables and fruits, making them pliable and consequently more easy to pack; it insures better cooking in the jar, and it usually results in better flavor, as it drives out some objectionable gases and odors that affect flavor. Berries, soft fruit and tomatoes are usually packed cold without preheating.

Processing or sterilizing is without doubt the most important operation in canning. No matter how carefully you perform all the other steps, if the processing is not thorough, if all the organisms are not rendered harmless, the material will spoil. But when all yeasts, molds and bacteria, both in the food and in the jar, are destroyed, and when the jar is sealed airtight so that no new organisms can enter, the food cannot spoil. If either one is only partially done, it will spoil.

Eliminate Microorganisms

The presence of air in a jar will not cause food to spoil, provided that the air is sterile, that is, free from all living organisms. A partially filled jar of food will keep perfectly if food, jar and cover are sterile, if the air space above the food is sterile, and if microorganisms cannot enter the jar. Molds and yeasts are quickly killed at temperature below 212° F., but bacteria occurring on vegetables are much harder to kill since many of them go into a so-called spore form, a form very difficult to kill.

Oven Canning

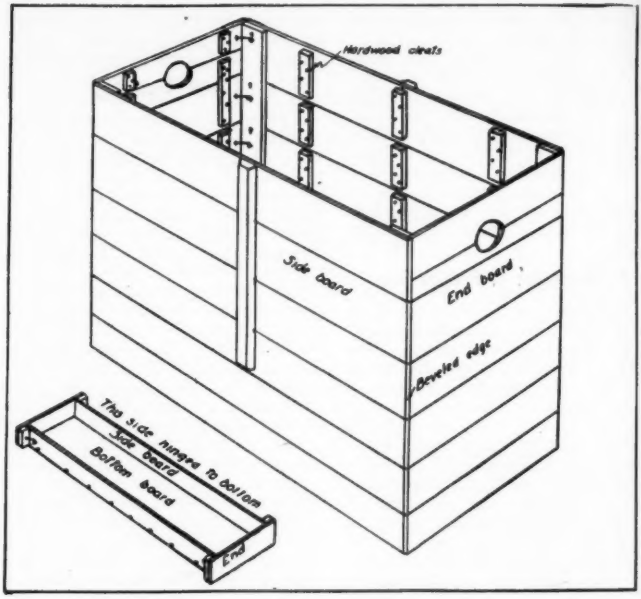
The oven of the electric stove can be used to great advantage in canning all fruits and tomatoes. It is easy to can this electric way. For all non-acid vegetables and meats, the United States Department of Agriculture recommends the pressure cooker, "Because of spoilage difficulties and the risk of poisoning from occasional contamination with botulinus bacteria when non-acid vegetables are canned by the water-bath method, the department recommends the canning of such vegetables with the steam pressure canner. . . . With non-acid vegetables and meats there is no assurance that bacteria are killed at the temperature of boiling water, unless the material is heated for as long as six hours. The heating time may be decreased very much if a higher temperature is used. This is the reason for the recommendation that meats and non-acid vegetables be canned under pressure."

Electric Light Cheaper Than Oil

Electric lights dispel the gloom of oil lamp illumination; this fact is unquestioned, but it is not common knowledge that electricity can be supplied at the rate of 6 cents per kilowatt hour to produce light for a third or a fourth the cost of oil lighting.

Recent tests revealed that a kerosene lamp which held about a quart of oil and produced 12.5 candlepower when the chimney was clean, cost just three times as much to use as an electric bulb of the same power.

A smaller lamp was still more expensive by comparison. Its capacity for oil was about one-fourth quart. Its cost per hour for a light of eight candlepower was sixteen hundredths of one cent. An electric bulb of 6.7 watts gave off an equal number of candlepower, and cost one-fourth as much.



Collapsible Forms for Septic Tank

The vertical pieces of two by four inches with cross struts supporting the sides are omitted in this sketch.

Freshly Poured Septic Tank. Grease Trap at Left, Cover Slabs at Right.

A Simple SEWAGE SYSTEM

By E. R. MEACHAM

IT WAS the first modern septic tank in the neighborhood. Mr. Chase, the owner of the farm, had dug the pit for it and provided the cement, sand and gravel. The College of Agriculture had sent out a sewage disposal truck with a set of forms for the concrete tank. Prof. E. R. Jones was there to conduct the demonstration and the neighbors had gathered to learn just how they could put in similar tanks for themselves.

"It's going to mean a lot to my family," said one of the men; "it would have meant even more when the children were too small to take care of themselves."

"Funny how one improvement leads to another," put in a neighbor. "We really had to have our water lift on account of the milk. We must cool it, you know, and those maples around our place had gotten so big that the windmill didn't always run, and then we were just up against it. But now that we have water under pressure, we can have a bathroom with an indoor toilet and they tell me that takes a septic tank. It seems as if we are going to get an up-to-date home because of those shade trees planted maybe a hundred years ago."

Comfort for the Family

"But think of the comfort the whole family will enjoy, especially in the winter time," returned the first speaker. "For the last fifteen years we've had a sink in the kitchen and the drain pipe runs to a big hole in the ground for what water went through the sink. It's never given us any trouble, and it has saved us carrying all that water and throwing it in the backyard to stink and breed flies."

"Well, isn't this septic tank they're building here today about the same thing as you already have except the concrete wall?"

"Not at all," broke in Prof. Jones, who had overheard the question. "Come over to the truck and I'll show you the difference."

On the side of the truck body a diagram of a simple sewage disposal system had been painted. As the men gathered around, Prof. Jones explained its operation.

A cesspool is a mere hole in the ground. The only way sewage can get out is by leeching into the soil. The solid sewage gradually clogs the soil pores and when the hole fills up, a new one must be dug. If the sewage escapes from the cesspool very readily, there is danger to the water supply. In fact, some state plumbing codes prohibit digging cesspools.

Septic Tank Operation

The septic tank, on the other hand, is a watertight box. Its operation depends on the action of bacteria. When the bacteria attack the sewage in the tank, part of the solid matter passes off as gas, most of it dissolves in the water, and a little settles to the bottom of the tank. Perhaps once in five years, it may be necessary to pump out this sludge from the bottom. Otherwise, the septic tank needs no attention.

But there must be some place for the water from the tank to go. If the septic tank is big enough so the bacteria have time to do their work thoroughly, this water called the effluent will be clear and odorless. Some people have claimed that it is pure water, but it certainly is not. Most of the solids in the sewage are dissolved in it and it contains bacteria by the million. There are several ways

of getting rid of it, but what is called a "dry well" is most common.

To be most effective, the dry well should reach a layer of porous soil that will absorb the water. It is usually dug eight or ten feet in diameter and ten or twelve feet deep. The sides are of loose stone to let the water seep through. But such a dry well should not be dug down to limestone anywhere near a water supply well. Even though the latter may be on higher ground, crevices in the limestone may lead to it. Even through seamy soil, germs may spread one hundred and fifty feet from the dry well.

Where a dry well is not practicable, the effluent from the septic tank may be discharged into the ground through a system of ordinary drain tile. If the soil is very tight, it will help to put gravel or cinders in the trenches around the tile. They should be laid from two to three feet deep and in lines about ten feet apart, using perhaps five hundred feet of tile altogether.

To make it easier and more economical for farmers to build their own sewage disposal systems, the Wisconsin College of Agriculture designed a set of collapsible wooden forms for a standard concrete septic tank. In every county in the state, they demonstrated how to use them. Then lumber dealers were induced to make up sets of forms for rental to their customers. The result is that there are now fully one hundred sets of these forms available to farmers in Wisconsin. Last year they were used to build at least one thousand septic tanks, bringing new comforts and sanitation to that many homes. The charge for the use of the form varies from one dollar to five dollars.

Actual Demonstration

When the discussions around the truck had brought out these general facts, the whole group moved over by the house to watch the actual construction. The pit was ready. For the Wisconsin septic tank, it must be four feet wide by nine feet long and be dug five feet six and one-half inches below the drain pipe of the house. That makes a pretty deep hole if the bottom of the cellar is to drain into the tank. At this farm, however, there was no laundry in the basement so the hole was only seven or eight feet deep. The tank should be set low enough so that it can be covered with about two feet of earth to prevent freezing. When sod has formed over this fill there is nothing to mar the appear-

Showing How Simple It Is.

ance of any yard or lawn. In this case the pit was only a few feet from the basement wall but as there is no contamination from a good tank that is all right.

Just ahead of the tank Mr. Chase had put in a grease trap. Only the water from the kitchen sink is greasy so that is all that passes through this trap. Its object is to collect the grease so it will not clog any part of the system when it cools and hardens. The water from the grease trap discharges into the tank with the rest of the sewage.

Now, someone started the quarter horsepower motor on the concrete mixer. Another brought water by screwing a hose on a faucet of the new water system. Soon the six-inch bottom for the tank was poured. When it was trowelled smooth a small stone was set in each corner to support the wooden inside form. These stones were pressed down into the soft concrete until they were exactly level so the form would stand plumb. Then the sides and ends of the wooden forms were lowered into the pit and hooked together. Braces were placed to keep the sides from bulging in and the whole form centered in the pit to leave a six-inch space for concrete all around. The earth walls of the pit act as the outside form.

A Good Suggestion

Instead of trying to dump concrete from a wheelbarrow directly into this six-inch wall space, it is better to tack a temporary tight board cover across the inside form. That keeps concrete out of the tank and protects the newly laid floor. It is easy to dump on this temporary platform and to distribute and tamp the concrete from there.

When the walls were as high as the holes in the ends of the form, Professor Jones set in the cast iron elbows. They were what are known as four-inch quarter bends with two-inch low heel outlets. When low heel quarter bends are not available high heel bends may be used by cutting off the two-inch bell—otherwise it comes so close to the cover of the tank that it does not give good ventilation. Into the inlet elbow they fitted a length of four-inch cast iron pipe with a threaded hole for the one and one-half inch pipe from the grease trap, and made the joint tight with concrete. At the outlet they used regular vitrified clay sewer pipe.

A Test Hole Provided

The walls were trowelled off level with the top of the form and then they poured the cover slabs. There were nine of these, each about four feet long by one foot wide, and three inches thick, reinforced with two one-half inch iron rods near the lower side. A lamp hole was made in one of them by setting a big tomato can in the concrete as it was poured. When the tank is finally covered with dirt an iron "finding rod" is placed upright beside this hole. Then, in later years, anyone can inspect the tank by digging down along the rod, uncovering the hole and testing the scum and sludge with a pole or hoe.

That completed the demonstration and it certainly looked simple enough for anyone to follow. A check-up showed that the following materials had been used for the tank itself.

24 sacks of cement
2 loads of sand
4 loads of gravel
18 reinforcing rods ½" x 3'10"
2 cast iron elbows
3 fir planks 2" x 12" x 3'3"

The planks are for a baffle across the middle of the tank to retard the flow somewhat. Grooves in the concrete walls are provided for them by cleats fastened to the outside of the wooden form.

The cost of sand, gravel and labor will vary in different communities but the other items mentioned should not cost over $25.00. Seventy-five feet of sewer pipe to reach the dry well usually cost about $10.00 more, or if drain tile is used to distribute the effluent underground it will cost around five cents a foot.

When one sees how little money it takes to put in a sewage disposal system it is easy to believe that

(*Continued on page* 37)

Electric Brooding of GAME BIRDS

By W. V. WOEHLKE

THE fifteen acres of the Sheldon Knoll Pheasantry lie in the outpost hills of the Santa Cruz range. Straight rows of apricot and prune trees swing over the sunny slopes. Behind a sheltering rise in the remotest corner of the ranch, as far from the entrance road and the house as possible, Chinese ring-neck and Mongolian pheasants scratch in runaways beneath a wire roof. Very wide are the meshes in this wire, for the pheasants have a habit of going straight up in the air on the slightest provocation. With a wide mesh there is a much better chance that their shoulders and wings rather than their delicate fool heads will stop the panicky birds and bring them back to earth again unharmed.

When H. L. Borden, after a career that included a commission in the U. S. Army, decided to raise pheasants for the game-bird market, he began in the usual way. He acquired a pen of pedigreed breeders, six hens and a cock, and bought hatching eggs from a distant game farm. When the eggs arrived, he looked around for broody hens to hatch them. Pheasants, like most game birds, will produce eggs in captivity, but will not hatch them.

A Discouraging Problem

"By the time we had ten or fifteen assorted hens busy hatching pheasant eggs, I was ready to throw up the sponge," said Borden, groaning in restrospect. "The hens never made up their silly minds to become broody at the right time. It took practically three hens for every setting, and then we had to chase all over the county to find birds that were really in the mood to brood. After that was settled and the hen got busy, her comparatively heavy weight did a lot of damage to the pheasant eggs, about half the size of the egg the hen was built to incubate. And when the eggs that survived the process were ready to hatch, the devil was to pay."

Electricity the Solution

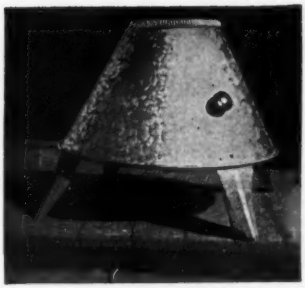
"That's wrong," interrupted Mrs. Borden. "A dozen devils were to pay. There was that big Plymouth Rock which started to kick the eggs in every direction just as they began to hatch. I chased her off, gathered the eggs that were not entirely hopeless, turned on the oven in the electric range, got a thermometer and for three hours regulated the temperature by hand until four of the little fellows were safely hatched and dry. That's all we got out of fourteen eggs. Another hen got so enthusiastic that she brooded the little wild things continuously, wouldn't let them out to get food and drink. We lost half of that batch. Others would just get up and leave their charges. And those that did a good job were so clumsy that they stepped on the little things or sat on them and crushed them. And the mess the big hens made in the coops! Though we dipped them carefully before putting them in the nests, we couldn't keep vermin out entirely. If we had to rear our pheasants with hens, we'd both become raving lunatics during the hatching season. It's the truth that electric incubation and brooding have saved our reason."

With endless travail, trouble and expense the Bordens succeeded during the first season in raising to maturity by means of foster mothers some 250 birds of which they retained the forty best for breed-

ing purposes. But before another hatching came around, they installed in the basement of the house four electric incubators with a capacity of about 1,400 pheasant eggs at a setting, using a few hens only to handle the overflow coming from the industrious hen pheasants in the runways.

The incubation problem was solved without much trouble. But how about mechanical brooding? The new pheasant breeder had heard that the California State Game Farm at Yountville was successfully using electric heat during the critical first six weeks of the game chicks' lives. Borden went to the game farm, examined the brooders there in use and proceeded to build twenty-five electric brooders with a total capacity of 550 chicks. The incubators were of the regulation commercial type made by a California manufacturer. The heating device of the brooders was an adaptation of the apparatus used on the State Game Farm.

It consists of a galvanized-iron cone twenty inches in diameter and fifteen inches high from apex to base, with legs that raise the lower rim five inches from the floor. The heating element is suspended from a socket built into the top. The



Portable brooder with a 125-watt heating element. The thermostat on the inside is regulated by the outside control screw. This hover will handle 20 to 22 pheasant chicks up to four weeks. While satisfactory for use without curtain in the moderate California climate, curtain would be necessary in colder zones.

110-volt current is brought in over two wires on the inside of the cone and passes through a wafer-type thermostat regulated by means of a control screw located on the outside of the cone in an easily accessible place. The apparatus is so simple that Borden was able to assemble it and do the wiring with-

Pheasant brooder of H. L. Borden showing heated brooder compartment in rear, covered vestibule and runway covered with wire netting.

out help. Both the incubators and the brooders are on a circuit independent of that which supplies the house.

The small brooding houses, placed on a slope with a southerly exposure close to the dwelling, have a sloping roof over the hover compartment, a covered vestibule and a sunny runway with a wire-net cover. A pilot light is set into the circuit on the outside of each coop. In the back of the hover compartment a hinged board enables the operator to remove the floor board for cleaning and exposes the thermostat switch.

Wattage Increased

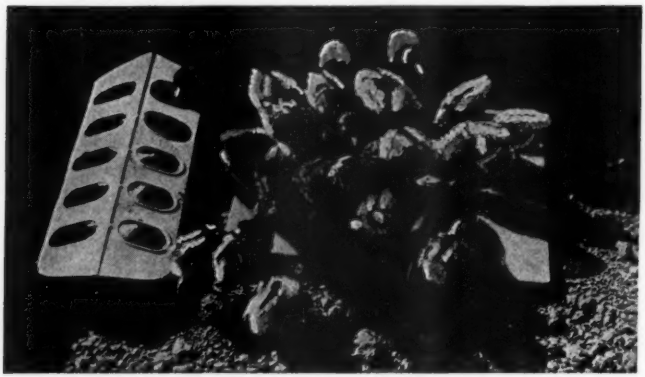
The first few brooders carried a 75-watt heating element, but this capacity was found insufficient to maintain the temperature at the necessary level during the sharp spring nights, hence it was increased to 150 watts. It was also found necessary to shut off access to the vestibule at night during the first week of the chicks' residence in the brooder and confine the baby pheasants to the heated part of the brooder. Of the first brood four of the babies died when they strayed into the cold vestibule during the night and didn't have sense enough to find their way back to the source of the heat.

"What a difference electricity has made in our life during the brooding season!" exclaimed Mrs. Borden. "It's pleasure to work with the interesting baby pheasants now. With hens as foster mothers, the place was like a morgue. Our mortality that first season was over sixty per cent. Now, with the initial lot of fifty-six babies in two electric brooders, we have had no mortality at all since we closed the vestibules at night. The chicks have made a faster growth and, as you can see, are uniform in size and vitality."

"So far as my experience goes," said Borden, "the use of electricity as a foster-mother is making game-bird production an economically feasible undertaking. If I relied on hens to do the hatching and brooding, I would have to keep at least five hundred of the pesky things so as to be sure to have a sufficient number of broody hens during the season. With the heavier breeds that might earn their keep the damage to the eggs and the mortality among the pheasant chicks would be excessive. And if we used the light but unproductive bantams, we would have to waste feed and care on them the whole year in order to use them for about three months."

Borden looked ruefully at a bat-

(*Continued on page 23*)



Borden's Baby Pheasants Feeding on Board in Sunny Runway.

STATIONARY SPRAY PLANTS FOR ORCHARDS

By CHAS. E. SEITZ

TIMELINESS in applying spray material regardless of oil conditions, and the opportunity of using an electric motor for power are the main advantages of a stationary spray system for the orchard. It can be used in the early season on soft ground when use of a portable rig would be impossible. Every fruit grower appreciates the importance of getting the spray on at the right time. Many growers say that this one advantage of timeliness is sufficient to justify the installation of a stationary spray system. However, there are many other advantages which make it superior to the portable rig system of spraying.

A few advantages of stationary spray plants over the portable rig, claimed by users, are:

1. **They reduce the labor time of spraying by one-half to two-thirds; in one carefully recorded case the saving was 63%.**
2. **They are adaptable to rough, hilly or mountainous orchards.**
3. **Inter-crops or permanent cover crops are not injured, as tractors or teams are not required.**
4. **There is a minimum of danger from knocking off or bruising fruit on low hanging branches.**
5. **They make it possible to prune for low wide spready trees.**
6. **They increase the amount of spraying per man.**
7. **Irrigation ditches are not damaged and irrigation can continue while spraying.**
8. **As good pest control is secured as with the portable rig and often better results on hilly orchards.**

The construction principles of the stationary spray plant are comparatively simple differing only in mechanical details from the portable rig. The stationary plant

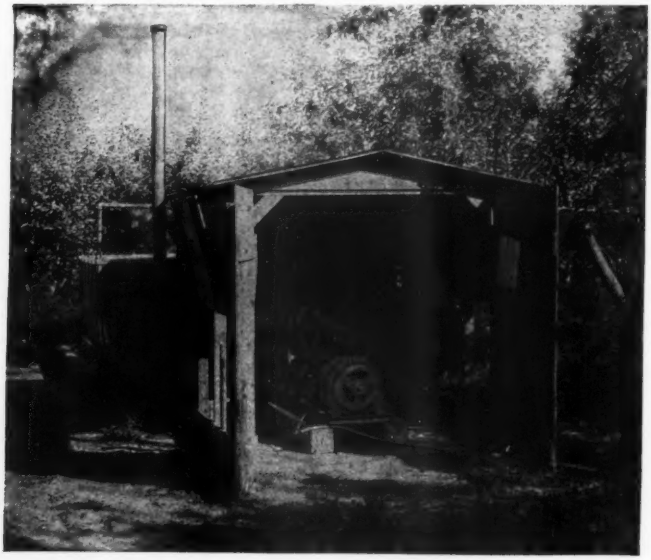
The Leatherman Mountain Farm, comprising two hundred and ten acres of apple orchard, is sprayed from the stationary spray plant housed in the buildings shown above.

usually consists of a large mixing or agitation spray tank; a heavy duty pressure spray pump, and power plant of motor or gas engine, all mounted together on a permanent base and centrally located near a good water supply.

The distribution system consists of a main pipe line leading from the pumping plant through the orchard with lateral pipe lines leading off from the main line at regular intervals. These laterals are equipped with faucets to which a hose may be attached for spraying. The pipe lines are laid either underground, on the ground or overhead. The underground method seems to be the most popular although the practice of using overhead pipe lines strung through the trees is gaining in popularity.

A few stationary spray plants have been in operation for a number of years in the Southeastern states. For instance a gravity operated plant was installed in Albemarle County, Virginia, about 1912, this being the first one on record in this state. Another gravity operated plant has been in successful operation for years in the Konnerock Orchard in Washington County, Virginia. Several plants have also been used in West Virginia for a number of years. One prominent fruit authority of the East who 2 years ago visited orchards in the far West where stationary systems are extensively used, has gone so far as to predict that stationary plants will in a few years supplant the portable outfits throughout the country.

Western orchardists have adopted the stationary spray plant quite extensively and with considerable profit. Even in 1927 over one-half of the 2500 orchards in the Wenatchee district of Washington were using stationary plants. At that time a representative of a leading spray equipment company stated that his organization was replacing portable rigs with stationary plants very rapidly and very few portable rigs were being sold in the Wenatchee district.



The stationary plant usually consists of a large mixing tank, heavy duty pressure pump, and power plant, all centrally located.

He predicted that in a few years more every orchard in the Wenatchee section would be using a stationary spray plant.

One of the orchards visited by the writer in the Wenatchee district was that owned by C. M. Chase, State Hydraulic Engineer, who operated a stationary plant on his 20 acres of apples. He had planted this orchard himself 22 years before. The complete cost of Mr. Chase's stationary spray system was $1,500, and he claimed that it paid for itself in 2 years, for he estimated that with his stationary outfit he saved two-thirds of his former cost of spraying with a portable rig. He estimated his electric power costs for operating the plant at an average of $3.00 per acre per season.

Installation Cost of Plant

The installation cost of a stationary spray plant with all pipe lines and other necessary equipment will depend largely on the size of the orchard which influences the size of plant and amount of power needed. In the Wenatchee district of Washington, for instance, the plant complete, piping, hose and all, installed for an orchard of not more than fifteen acres costs between $1000 and $1400 or about the same as the cost of a portable outfit.

On steep hill-side, or mountain orchards the costs will vary considerably. For one of 210 acres, which is on as steep a slope as the writer has ever seen an orchard, the total cost was about $5000. On another West Virginia orchard of the same acreage, but which is comparatively level, the cost was $3000. The first plant displaced four portable rigs while the other plant displaced three portable rigs. As a rough estimate one might figure that the installation cost of a stationary plant will be about the same as the cost of the portable rigs necessary to efficiently cover the orchard.

A good bulletin on Stationary Spray Plants has been published by the Washington Agricultural Experiment Station, Pullman, Washington. This bulletin is by Harry L. Garver, investigator for the Washington State Committee on the Relation of Electricity to Agriculture. The California station has also published a good bulletin on the subject. A list of manufacturers of stationary spray equipment may be had by writing the Editor of this magazine.

Illinois Farmers Feed Herd Improvement Cows Grain

Ninety per cent of all the members of the Illinois Herd Improvement Association feed grain during the summer, according to the annual report recently issued by them. Since it is essential to grind for best results it is evident that a convenient setup is important for preparing the dairy ration during the crop growing and harvesting seasons, when there is little time available for this work.

Value of Protein

The value of sufficient protein in the ration is also shown in the report by one member who added ground soy beans to his herd ration of corn and cob meal and ground oats. This reduced the cost of producing butter fat by six cents a pound, the herd increasing in average production from 22 pounds in February to 34.5 pounds in March.

Brooding Game Birds

(*Continued from page 20*)

tered, ancient tropical helmet he carried in his hand. "I've got to feed the birds now," he said apologetically, "and they insist that I wear this wreck of a helmet that saw service in the Philippines years ago. They know me in that thing. Without it they won't recognize me; the first pen will start to tower and all the other pens will follow suit and hit the ceiling, some of 'em coming down with bloody noses. They are just like a lot of people: Anything strange, unaccustomed and new arouses their suspicion."

OUR NEW HIRED MAN

By H. B. HOWELL
County Agricultural Agent
Grants Pass, Josephine Co., Oregon

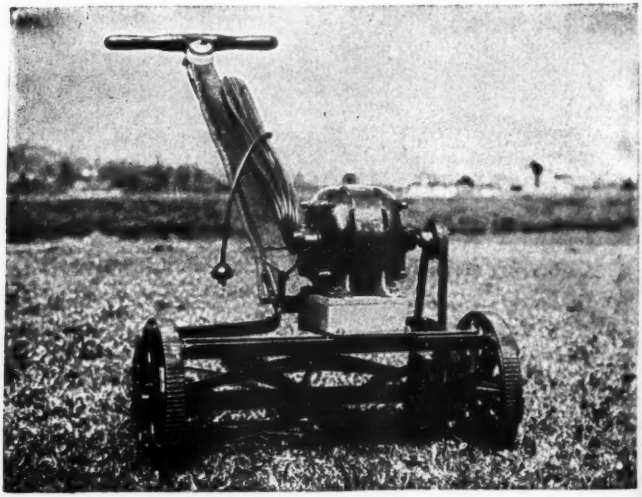
MY lawn always grew the fastest when I had no time to cut it. Before I "electrified" my mower it took several hours of hard work each week. So I conceived the idea of making over my old mower and started in.

First, the gears on the cutter bar were taken out, then a "V" pulley five inches in diameter was secured and after cutting off one inch of the blades on the left side of the revolving cutter, this pulley was mounted and fastened by set screws.

Two pieces of ¾ x ¾ angle iron were cut to just fit in between the frame and brazed fast by a local welder. Then across this a plate was fastened to hold the motor so that it would be over the revolving cutter. A "V" pulley on the motor 2½ inches in diameter gave the speed reduction required. The motor speed was 1,750 revolutions and that gave the cutter at about 775 revolutions just a little faster than it rovelved when driven by the wheels. An endless "V" belt made for washing machine was used.

A cord to snap switch on the handle and two hooks on the handle to hold the cord, similar to some of the vacuum cleaners, completes the job.

The accompanying photo shows how the completed mower looks.



Electricity Eliminates the Push from the Lawn Mower

Four service outlets on each side of the house made it easy to "plug in."

In operating the cutting is started next to the house, working back and forth, thus the cord never gets in the way.

The cost of the mower was about as follows:

¼ H. P. Motor (second hand)	$7.50
65 ft. of rubber covered cord	6.50
Belt	.90
Switch	.40
Welding and machine work	2.50
Total	$17.80

Now the job of mowing the lawn is a pleasure and instead of being hard work for a tired farmer it can easily be done by the children.

Then, too, high grass has no terrors for such a machine as slippage of the traction wheels is now no problem and if the grass is too high, it is only necessary to push the mower slower and allow it to "eat its way" into the tall grass. Or one can hold up the handle and cut it as high as you like the first time over.

After the cutting job is completed it looks much smoother than it would with the ordinary mower because of the higher speed of the cutter, and because there is no slipping.

That the "home-made" mower is easy to construct and has some merit is shown by the fact that four of my friends and neighbors after seeing this mower have built them for themselves.

Incidentally this makes the fourteenth motor now helping out as "hired men" on our farm.

MR. KILOWATT LENDS A HAND

By HAZEL L. HILL

HOW often we find that things are not exactly as we have imagined. I had thought that life would be simply perfect when I married a young farmer and came from the city to keep house in a snug home set well back in a beautiful shady lawn. I soon found, however, that household duties gave little time for leisure and that embroidery, piano, pleasure trips, and the books that formerly occupied my idle moments must be pretty much discarded.

We had electricity from a rural line, when I began to keep house nine years ago, but it was used only for an electric water system and for lighting. My husband and I have always wanted electric servants, but, like most young couples we were not very well supplied with the where-with-all to provide them. We decided to buy appliances which would equally lighten the burdens of both of us and not to get anything until we could afford what in our judgment was the best of its kind.

As our first unit we procured a milker and a separator motor for the better half, and a washer and

The electric milker [illegible] keep this young man [illegible] his dad.

Electricity in this farm home, located near Baraboo, Wisconsin, provides daily opportunity for recreation.

vacuum cleaner for me at a total expenditure of $455.

That was a lot of money to us, but let's see just what the investment has returned. During the "Days of Slavery," as we often refer to them, two hours were required night and morning to milk the cows, separate the milk and feed the calves. Now the same work has been made infinitely easier and is done in an hour and a quarter at a cost for current of $.03 a day.

Praise Labor Savers

The saving in time seems wonderful to my husband but he thinks the finest feature of the milker is that it makes hired help easy to keep. The washer and vacuum cleaner shorten my work four hours a week at a current cost of about $.02.

Annual depreciation and up-keep at 10% is $45.50; interest at the rate of 6%, makes $27.30; and electric current at $12 at the rates in force here give a total annual cost of $84.80. We find that the total time our first unit saves each year for my husband, our hired man and myself amounts to 1,300 hours. This costs us 6.6 cents per hour. In other words if a person were to do this same work for us, that electricity is now doing, his time would actually be worth $.66 for a 10-hour day.

Our second unit consisted of an electric refrigerator and a folding ironer, together costing $400. It seemed that during the summer, whenever time was precious, our old refrigerator was sure to be empty and some-one had to go two miles after a cake of ice. Now the only time the men folks think about ice in warm weather is when they cool a drink with some cubes or smack their lips over a tasty frozen dessert.

We find that the refrigerator is fine during cold weather too, as foods are kept perfectly with no danger of freezing, and meat never dries out or loses flavor when stored for long periods. The current has averaged about $.90 a month and we would never be without the convenience of electric refrigeration if the operating cost were three times as great.

Laundry Help

The selection of an ironer was given careful consideration, and we finally chose one that folds into a small space when not in use, has a clothes bar, pushes about easily and most important of all is controlled by the knee, leaving both hands free to guide the clothes. With a little practice anyone can, without fatigue, iron as neatly and at least three times as rapidly as is possible with a flat iron with a current cost, at our rate, of $.06 per hour.

Washing and ironing used to be an all day task but now it takes

(*Continued on page 36*)

ELECTRICAL HOUSEKEEPING

Conducted by
GAIL MEREDITH

Wired Winds

IF we could pick up our families, our gardens, and our chickens and move to the seashore for the summer, we would not have to worry about a wind. We could revel in salt sea breezes all day long. Or if we could pile the folks into the family car and ride and ride up mountain roads till all the air is sharp, and fresh and cool, we would forget the heat on the plains below. But most of us stay at home, and there is no magic to bring the seashore or the mountains to an inland farm. But there is a simple way of catching part of the comfort of a sea wind and a mountain breeze just by setting up an electric fan.

Fans will give us the winds you want whenever, wherever we want them. They never pretend to surpass a cool north breeze, but they do modestly remind us that they will start up a wind in our living room when we lie down for a nap in the afternoon, or they will send a soothing stream of moving air across the bed at night. They are so regulated that they will move fast or slow, as we set the switch. They will send the air coursing before them all in one direction, or they will swing back and forth to cool the whole room.

There is more comfort in a fan than just the breeze it brings. It stirs up stale housed air and keeps it moving so it gives place to fresh. It carries the smoke and steam out of the kitchen before it can settle on the curtains and walls. It carries out the smell of cooking, too, before it gets all through the house.

When we stop in to shop for a

There is a Breeze Any Time if You Turn on the Fan.

fan, there are several things to consider besides the price and the looks. A fan should be strong and sturdy. Its motor should be quiet, and should not interfere with radio reception. It should have guards over the blades of the fan so they will not catch in a flapping curtain.

Then when we get this weather maker home and plug it into a convenience outlet, the cost of keeping up a breeze in our houses will be just about the same as burning an electric lamp, for the motors in many of the household fans take only from twenty to forty-five watts.

Ironing by Machinery

THERE is nothing complicated about the small ironing machine. It has a padded revolving roll for an ironing board, a smooth curved shoe that fits snugly around the roll for an iron, and a motor to turn the roll round and round ceaselessly under the hot shoe. Electricity heats the metal shoe and runs the motor that turns the roll.

Ten years ago, or perhaps it was fifteen, a friend of mine used to get quite a laugh from any group by claiming glibly that she did not know the difference between a spark plug and a differential; cars were all alike to her. She still says it on occasion, but it falls a little flat nowadays, for women have rather stopped thinking it smart to be stupid about machinery since they use it in their houses for so many different jobs.

There is certainly no reason for a woman who can concoct a marble cake and make firm, quiver-

This Young Woman Turns on a Breeze While She is Ironing.

ing jelly to stand abashed before a simple machine. She can learn all she need to know about its "innards" and master its control in less time than it took her to learn how to make an angel food cake.

This is certainly true with the small ironers. We bring out the portable ironer and set it up on a convenient bench or work table, or if it is on legs of its own, we roll it out into place. Then we plug the attachment cord into a convenience outlet.

To be sure, we had to learn that we must not attach it to a drop cord or a light fixture, but it was not difficult to understand that cords built to carry electricity to a sixty-watt lamp were not heavy enough to take it to an iron demanding a thousand watts.

After that all we had to learn was which button to press to heat the iron, which to punch to start the motor, and how to move the lever to pull the iron against the ironing board, and how to move it to release the iron again.

Those simple operations are all the machine demands.

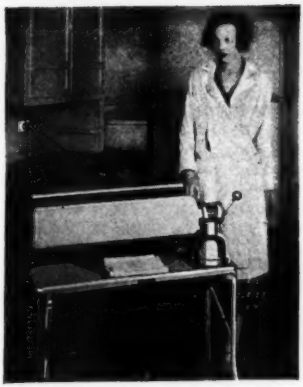
Reduces Labor

Like the electric washer, the ironing machine lessens the labor of keeping clothes clean. We just sit down in a comfortable chair and guide the cloth through the ironer. The few controls are within easy reach. The hard work is taken out of the job. The motor lifts the iron and pushes it over the clothes. The motor exerts the pressure that we used to put on the iron to do the work. We sit instead of stand; we guide instead of push. It is much easier.

Doing the work by machinery saves a considerable amount of time. Ironing with an iron twenty-six inches long and five to eight inches wide, pushed ceaselessly, tirelessly by a little electric motor is a much faster job than ironing with the average hand iron.

Various tests show that an ironing machine saves from one-third to one-half of the time required to iron the same clothes with a hand iron.

Naturally the time-saving is dependent on the kind of clothes and the experience as well as skill of the operator. If there is a great deal of flat work in the family washing, the saving will be greater than it will be if the bulk of the washing is shirts and children's clothes.



She rolls the ironer out, plugs the cord in and presses this button to heat the shoe.

As a woman grows accustomed to using a machine she will handle the ironing more quickly, of course. Some women will learn faster than others; some women will do better work than others, just as some women iron better with a hand iron than their neighbors do. After they learn the way the machine works, developing speed and skill is entirely a personal matter; but in view of the enormous saving of time and strength it promises folks can quite well afford to be patient about the learning.

Cooking With Cold

COLD is almost as important as heat in getting our meals nowadays. We have been cooking foods for the last few thousand years because they taste better that way. Within the memory of a lot of us, we have learned that chilling food makes it taste better, too.

Cold puts an indescribable edge

on the flavor of grapefruit; it brings out new delicacy in a melon. Cold improves both the taste and the texture of the green vegetables we eat raw; it prolongs their freshness and sends them to the table crisp and appetizing.

The foods that are prepared by heat have to be properly protected beforehand, and unless they are provided manna like, day by day, they must be properly protected afterwards, too, if they are to keep.

Mechanical refrigeration will not cook raw food, of course, but it offers a host of possibilities for finishing up appetizing dishes with cold instead of heat. That means a good deal for summer meals. We can get our food together early in the morning before the sun is hot, and store it away in the refrigerator ready for noon and night. We can get it ready one day and we can eat it the next.

We can lay out whole meals if we will, where the "cooking" is done with cold. Take these two recipes for the meat dish, for instance. They are both made with chicken, and they are both finished off in the refrigerator.

Frozen Chicken

1½ c. cold chicken cut up in small pieces

The chicken salad and banana mousse are in the two freezing trays ready for supper. The glass dish below the cooling unit holds a supply of ice cubes already made.

¾ c. crushed pineapple drained
½ c. nuts chopped fine
1 c. mayonnaise
1 c. heavy cream
salt

Put the chicken, pineapple and nuts together. Next mix cream and mayonnaise and add to the chicken. Put in tray to freeze.

Chicken Salad

1 tbsp. gelatin
¼ c. cold water
1 c. mayonnaise
2 c. cooked chicken
½ c. chopped celery
¼ c. chopped peppers

Soak the gelatin and dissolve over boiling water. Add this gelatin to the salad dressing, and fold in the chicken, celery and peppers. Turn into a mold and chill.

Your vegetables as well as your meat can be served chilled instead of piping hot this weather. If you like them frozen, try this one.

1 quart tomatoes
3 tbsp. sugar
1 tsp. onion juice
salt and pepper
1 chopped green pepper
1 c. chopped cucumbers and celery
1 c. mayonnaise

Cook tomatoes with sugar, salt, pepper and onion juice and put through sieve. Rub all the pulp through, too. Add the other vegetables and, last of all, the mayonnaise. Pour into tray and freeze.

Or you can get all of your vegetables in this way, too.

1 pkg. lemon-flavored gelatin
2 c. boiling water
2 tbsp. vinegar
1 tsp. salt
1 c. chopped celery
1 c. shredded cabbage
½ c. grated carrot
1 green pepper chopped

Dissolve gelatin in boiling water and add vinegar and salt. When it begins to thicken, add vegetables and turn into a mold.

Here are several new desserts that have proved popular with women I know. The first is a simple ice box cake.

Ice Box Cake

4 eggs
1 tsp. vanilla
1 pkg. German sweet chocolate
vanilla wafers

Beat yolks of eggs well, melt chocolate and add to yolks. Then add well beaten whites and vanilla. Line a shallow pan with vanilla snaps. Pour some of above mix-

ture over them. Then add another layer of cookies as before, pouring the rest of the mixture over them. Put in refrigerator over night. Cut in squares and serve with cream.

Orange Sherbet

1 tsp. gelatin
½ c. cold water
1½ c. sugar
1½ c. boiling water
grated rind 2 oranges
2 eggs
1 c. lemon juice
1½ c. orange juice
1 pt. cream or evaporated milk
½ c. powdered sugar
few grains salt

Soak gelatin in cold water for five minutes. Dissolve gelatin and 1½ c. sugar in boiling water; add orange rind, lemon juice and orange juice. Place in tray of refrigerator and freeze to a mush. Beat cream until stiff, add ½ c. powdered sugar and salt. Separate yolks from whites of eggs. Beat yolks until thick and lemon colored and whites until stiff, combine, and add to cream. Fold into frozen mixture and return tray to refrigerator. Stir twice during freezing.

Banana Mousse

18 marshmallows
2 tsp. lemon juice
½ c. boiling water
¾ c. mashed bananas
½ pt. cream

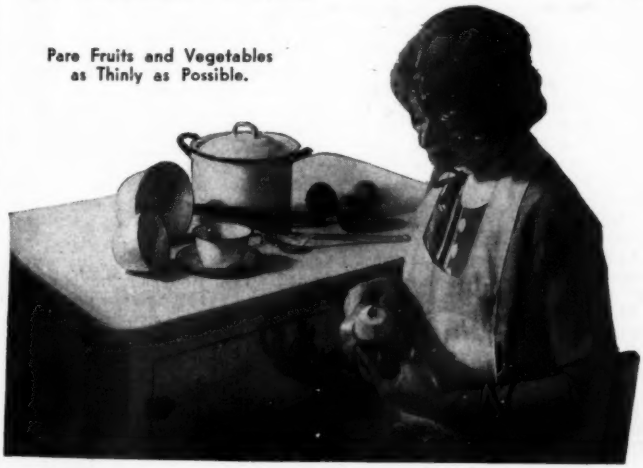
Melt marshmallows in boiling water. Add banana pulp and lemon juice. Cool. When quite cool and slightly thickened, combine with cream, which has been whipped until stiff. Pour into trays and freeze without stirring.

Thrift in Little Things

By Katherine Goeppinger

IT is an old saying that a woman can throw out more with a teaspoon than a man can bring in with a shovel. The best housekeepers are economical managers, keeping in mind always the fact that what has been bought and paid for should be utilized and not wasted. Because of its interest in good use of the family income, the Bureau of Home Economics of the United States Department of Agriculture indorses the following suggestions:

Slices of cut bread tend to accumulate in the bread box. Why not use a bread board and sharp knife at the table and cut off just what is needed? Leftover slices of bread will occur even with this effort to keep their amount low. They can be toasted or oven-dried and eaten like toast, or rolled out for the bread-crumb jar; used for scalloped dishes, bread pudding,



Pare Fruits and Vegetables as Thinly as Possible.

stuffing, thickening for soups, sauces or gravies, in place of part of the flour in muffins, pancakes or breads, or boiled in hot milk to serve in place of cereal.

Sharpen knives, and pare fruits and vegetables as thinly as possible. Peaches, beets and tomatoes may be blanched and cold dipped to get the skins off quickly and economically. When beets, turnips, and kohlrabi are young and fresh the tops may be cooked as greens. Small amounts of different kinds of greens can often be combined in one dish.

Why waste butter? Use individual bread and butter plates or butter saucers, to keep unused butter clean and usable for cooking.

Small amounts of leftover cereal can be put into bread, muffins, or griddlecakes in place of part of the flour and liquid.

Dry cake can be used as the basis of a fruit short cake or an ice cream sandwich.

People used to think skim milk was only good for the pigs. Except for the butterfat and vitamin A, skim milk is as valuable as other milk. It enriches soups, sauces, or pudding.

Many Uses for Sour Milk

When you have sour milk on hand, of course you can always make it into cottage cheese. Look also in your favorite cookbook under waffles, biscuits, ginger bread, pancakes, muffins, and cakes for recipes in which sour milk is called for.

Make a good amount of gravy after cooking a roast, as many of the good meat extractives are in the roasting pan. Save what gravy is not served at the table to warm up the leftover slices, for use in a "shepherd's pie," to thicken croquettes, or to combine with vegetables, macaroni or noodles.

Leftover fish may be creamed, scalloped, or made into fish chowder, when free of bones and skin.

Most fats can be used for frying, baking, or other cooking when cleanly rendered. Separate the different kinds in covered labeled jars, and store in the refrigerator. Keep fat in which fish has been fried entirely apart from the jars of chicken, beef, bacon, sausage or ham fat which are useful for flavoring soups, gravies, and vegetables.

If you know the tail-ends of steak or chops will not be eaten, why not cut them off before serving and reserve them for a stew, hash, meat balls, or other "made" dish at another meal?

Baling Solves Hay Storage Problem

THERE is already plenty to do on the farm without adding another chore unless it is absolutely necessary. However, heavier yields of clover and alfalfa hay from liming, and increased fertility due to a larger number of livestock being fed, make the problem of adequate storage real, and a pressing one on a number of cornbelt farms. Leafy, bright colored hay, cured in the windrow with a side delivery rake, and worth $25 or more per ton is too valuable to leave out in the fields to weather in the stacks. While many have wondered if the extra work of baling would be worth while, one of the largest feeders in central Iowa has proved to his own satisfaction that the baling actually saved enough time in the feeding to pay for this work.

Where it had taken two men to feed the loose hay in racks in the open feed lot, one man could do the job in less time with baled hay. Furthermore, practically none of the hay was wasted or trampled underfoot as compared with handling loose hay. Much more baled hay could be stored in the barn than was possible before, and it was more economical to build a shed to hold the surplus than it would have been to have erected sufficient shelter to take care of all the hay, if stored loose.

Many dairymen report that they can save enough time in handling baled straw to make the practice worthwhile. This is especially true where it is necessary to transport it to a number of outbuildings. Baling also eliminates a serious fire hazard.

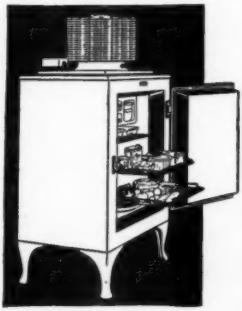
For stationary baling, automatic feeders have been developed which usually make it possible to eliminate a man from the baling crew.

General Electric Refrigeration

DEFIES

DEATH VALLEY'S

Blazing Heat . . .



NEW
SLIDING SHELVES
LOWER PRICES
a complete
3-YEAR GUARANTEE
on all models

HUNDREDS of miles away from any possible service facilities, in Death Valley, where the average summer temperature is 122°, the owners of the famous Furnace Creek Inn, pleasant and popular winter resort, chose General Electric Refrigeration because of its unfailing operation. Few Refrigerators are ever called upon to serve under such severe conditions. But no matter where you live—the General Electric Refrigerator with the famous Monitor Top will save you money, give you attention-free, care-free service. New refinements, new low prices, a three-year guarantee. See the new model Refrigerators and Milk Coolers at your dealers—now.

General Electric Company, Electric Refrigeration Department, Section CZ7, Hanna Building, 1400 Euclid Avenue Cleveland, Ohio.

Join us in the General Electric Program, broadcast every Saturday evening, on a nation-wide N. B. C. network

GENERAL ELECTRIC

ALL-STEEL REFRIGERATOR

Domestic, Apartment House and Commercial Refrigerators, Electric Water Coolers and Milk Coolers

Questions and Answers

Conducted by
H. J. GALLAGHER
Agricultural Engineering Dept.
Michigan State College

Note—Readers are invited to send in questions which will be answered in the order received.

Questions: *Please answer the following questions:*

1. *In transmitting power, how do wood, paper and iron pulleys compare?*

2. *With a 1725 R.P.M. motor and 32 tooth pinion, what size gear should be used to drive a machine at 200 R.P.M.?*

3. *How are proper belt sizes determined?*

Answers: 1. Under similar operating conditions papers pulleys have approximately 65 per cent greater transmitting capacity than iron pulleys and 30 per cent greater transmitting capacity than wood pulleys.

The face of the pulley should be ½ inch wider than the belt.

The motor shaft should rotate so that the pull is on the bottom side of the belt.

Where leather belts are used, the hair side should contact the pulley. Endless belts are preferable on smaller pulleys.

2. To determine the number of teeth on a pinion or gear to drive a machine at a given rate of speed practically the same formula is used as in determining the proper size pulley, the only difference is that the number of teeth of the gear or pinion is used in place of the diameters of the pulleys. The formula is: R.P.M. of motor x number of teeth on pinion = R.P.M. of driven machine × number gear teeth.

1725 R.P.M. × 32 pinion teeth = 200 R.P.M. × number of teeth in gear.

1725 × 32 = 200 X (X = number gear teeth)

200 X = 65,200

X = 326 teeth on gear

Where gear drive is used the motor shaft pinion should be carefully lined up with the gear so that no end thrust will occur on the motor bearings.

3. The power that a belt will transmit is determined by its width, thickness and the speed in feet per minute at which it travels.

The speed of a one-inch belt required to transmit one horsepower is the unit generally used to measure the capacity of belts. For single or light double belts the value is 700 feet per minute. The horsepower transmitted equals the speed of the belt in feet per minute × the width of the belt in inches divided by 700. For heavy belts the value is 450 feet per minute and the formula

$$\text{H.P.} = \frac{\text{Ft. per min.} \times \text{width of belt}}{450}$$

Belt speeds of 3500-4500 feet per minute are preferable to the higher speeds.

Belt speed in feet per minute = diameter of pulley × motor R.P.M. × 2618.

THE more a man is educated, the more it is necessary for the welfare of the State, to instruct him how to make a proper use of his talents. Education is like a double-edged sword. It may be turned to dangerous usages if it is not properly handled.—Wu Ting-Fang.

Saving Labor in Corn Shelling

A good method of cutting down the labor requirement when shelling corn is to build a tunnel in the floor of the crib, big enough to accommodate the extension feeder from the sheller. A shaft two feet square gives ample space to slide the drag feeder into it.

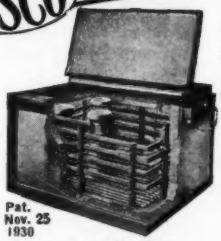
Short boards are laid across the tunnel, and are taken up as the corn is removed. With this plan only one man is needed in the crib, where ordinarily two, three or four men are required.

If the crib is not too wide, or is high enough to permit a large per cent of the corn to roll down, only one tunnel is necessary. Where the building is divided into compartments, a tunnel must be laid in each division. To allow ready attachment of the extension feeder to the regular sheller feeder, the shaft should extend out several feet into the driveway, or in front of the crib. This aperture can be covered with heavy timbers to permit driving across it.

A. R. McElhinney, a Tama county, Iowa farmer has used the plan of building a tunnel in the floor of his crib with great success. In three and one-half hours two men on the McElhinney farm shelled and binned 2,000 bushels of corn without the aid of any sort of a scoop shovel. One man kicked down corn in the crib and took up boards, while the other worked on the cob pile.

Lack of proper care of the separator and milk utensils also cause waste due to poor quality of cream. O. E. Reed, Chief, Bureau of Dairy Industry, estimates that every year approximately 40 million dollars is lost to the dairy industry through low grade products. Because this factor greatly affects consumption much of this loss is suffered by the farmer.

KEEPS MILK SWEET AND PURE The ESCO Way



There are three important steps in keeping milk sweet and pure the ESCO way:

WASHING CANS AND PAILS requires hot water — easily and cheaply heated in an ESCO Electric Water Heater.

STERILIZING CANS AND PAILS requires an ESCO Dry-Air Sterilizer. Electrically heated and built to hold the heat, this unit keeps utensils clear of bacteria.

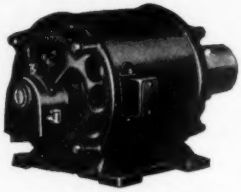
Pat. Nov. 25 1930

COOLING MILK. The ESCO Electric Milk Cooler quickly cools fresh milk to below 50° and keeps it cool until shipped. Operating cost less than with ice. No hard, disagreeable work. No troubles with ice shortage, etc.

Ask your Power Company, Electric Refrigeration Dealer, Hardware or Implement Dealer, or write to us.

ESCO CABINET COMPANY WEST CHESTER, PA.

"They Keep a-Running"



½ Horse Power Century Type RS Repulsion Start Induction Single Phase Motor

Water!

You can have plenty of water, any time, day or night, the year 'round, with a Century Motor driven water supply or pumping system . . . Water when and where you want it—for the kitchen, bath, laundry, at the barn, for irrigation, washing the car, fire fighting, sprinkling the lawn or garden. The motor may be automatically controlled by a float or pressure switch to keep the water at the correct level and pressure.

The built-in ability of Century Motors to "Keep a-Running" has been proved in many hundred thousands of installations.

Built in all standard sizes from 1/8 to 40 Horse Power

CENTURY ELECTRIC CO.
1806 Pine St. St. Louis, Mo.

40 U. S. and Canadian stock points and more than 75 outside thereof

Century MOTORS

Mister Kilowatt

(*Continued from page 26*)

me only 2½ hours for our family of six.

It would be rather hard to estimate the investment return on our second unit because of the many things that would have to be taken into consideration when thinking of the value to us of our refrigerator. Perhaps it is enough to say that once installed either of these electric conveniences soon comes to be regarded as indispensable.

My husband talked for a long time about getting an all electric radio but I thought we might better keep the one we had and have a phonograph. The difference of opinion was settled by buying a combination of the two, so now when radio conditions are not the best we turn a switch and the phonograph is ready to do its stuff.

When the dairy cow again comes into her own, we intend to purchase

Six-year-old sister likes to iron the flat pieces.

a fourth unit consisting of a feed grinder and an electric range. Small, electric, hammer type grain grinders are now on the market which produce a satisfactory product, require not to exceed five horse power, do not need watching, are economical in operation, reasonable in first cost and above all durable and simple.

The reason we have not considered the elimination of wood and ashes long ago is because we

supposed electric ranges were expensive to operate. Last fall a friend installed a range and water heater, having them connected with a separate meter. Imagine our surprise upon learning that the current consumed in cooking and heating water for a family of eight has averaged $1.50 per week.

I have three kiddies to look after now but thanks to the untiring, efficient service of "Mr. Kilowatt," every day contains at least a few moments that I can truly call my own.

Sewage System

(*Continued from page* 17)

better understanding of just how to do the work will help many people to enjoy its advantages. For it will save time and strength in carrying wastes away from the house. It will safeguard health by reducing exposure. It will promote more regular body habits. It will encourage better sanitation. As the man said at the demonstration, "It's going to mean a lot" to any family that puts it in, for it will double the value of the farm water system.

Editor's Note: While the above describes home built sewage disposal systems, it should be noted that there are on the market at the present complete sewage disposal systems for farm use. Such systems are well designed and efficient and their cost is moderate.

Oh, Yeah?

"Help your wife," counsels a noted domestic expert. "When she mops up the floor, mop up the floor with her."

Discussing the trade cycles, Sam Hill, in The Cincinnati Enquirer, says what the country needs is a buy-cycle.

Well, all it has to do is use its tricycle.

Any Other Time O.K.

It's all right for a woman to hold on to her youth—but not while he is driving.

What About the Spare?

The first time a Scotchman used free air in a gas station he blew out four tires.

These "hit-and-run" drivers are bad enough but the "hip-and-rum" drivers are worse.

THE SILVER PRINCE

PAUL

Running Water at Low Cost » »

AN *unfailing, abundant water supply,* instantly available for the kitchen, laundry or bath! A plentiful supply of water *with adequate hose pressure* for sprinkling the lawn or garden, fire fighting or washing the car!

This new Paul Silver Prince Water System is a real outfit, *pumping 300 to 400 gallons per hour* and yet the price is amazingly low. You can have the same modern conveniences as your city neighbor—and enjoy them while you pay for the Paul on twelve easy monthly payments. *Write today!*

Fort Wayne Engineering & Mfg. Co.
Fort Wayne, Ind.

Fort Wayne Engineering & Mfg. Co.,
1722 N. Harrison St.,
Fort Wayne, Indiana.

Send complete information and prices on the Paul Silver Prince Water System and easy payment plan.

Name _____

Address _____

City _____ ***State*** _____

Cullman *Electric* PUMP DRIVE

Will Run the Grindstone too.

Can be furnished with a shaft extension for mounting a low speed power pulley.

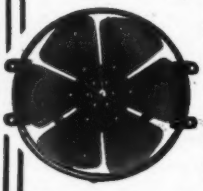
Does odd jobs and pumps water at an unusually low cost.

Easy to install—clamp the Drive to the pump and connect the wires.

Bulletin on request.

CULLMAN WHEEL CO.
1342 Altgeld St., Chicago, Ill.

VENTILATE with MARATHON "OK" FANS



You could not do good work if you had to breathe bad air. Neither can cows or chickens. This powerful Marathon

Dust Proof Motor

means longer life; drives specially designed 6 blade 'prop' that moves more air. Note these low prices and write for all details!

16"—1725-850 RPM
or 1140-550 RPM $37.50
18"—1725-850 RPM
or 1140-550 RPM $67.50
20"—1140-550 RPM $77.50

Marathon Electric Mfg. Co.
Wausau, Wisconsin

Valuable Information

All the manufacturers you will find represented in our advertising pages have interesting and valuable data about their equipment which is yours for the asking. When writing, be sure to mention ELECTRICITY ON THE FARM.

The LAUSON
DIRECT GEARED ELECTRIC JACK

Model No. 3

Built like a high grade auto transmission.

Also interchangeable motor or gas engine.

The Lauson Corporation
700 Michigan St., New Holstein, Wis.

MORE PROFITS *from Chicks*

For breeders, poultry-raisers, hatcherymen—extra quality, extra profits in Petersime Electric Hatched Chicks. Petersime Incubators give unmatched results — lowest operation costs—built in five sizes from 1,400 to 15,984 capacities.

Write for NEW FREE Catalog.
No obligation

Ira M. Petersime & Son
EF-37, Gettysburg, Ohio

WINNERS of May Contest

First Prize—$25.00

**"Now taking a bath is not such a chore,
The electric motor pumps water galore."**

Marion Palmer, R. I., Forest Lake, Minn.

The following titles have been selected as winners of the $5 cash prizes:

"It seems to me this picture ought to teach, Electricity puts everything within my reach." Mrs. Kitty Harrison, care Hayne Jones, Walhalla, S. Car.

"Today electricity makes his bath a joy, Recalling the difference when he was a boy." Mrs. Mattie T. Cramer, Malta, Mont.

"He smiles as he thinks of those days of yore, When he chased the soap 'cross the kitchen floor." Mrs. F. E. Lockwood, R. 6, Milford, Mich.

"Running water, hot and cold; How different from those days of old." George Crabtree, R. 4, St. Joseph, Mo.

"Dad used to bathe with his chin on his knees, But now he can do it with comfort and ease." Mrs. Grace Baertsch, R. 4, Baraboo, Wis.

RULES for July Front Cover Title Contest

For the best title to this month's front cover illustration, a cash prize of $25.00 will be awarded.

In addition, we will pay $5.00 for each of five titles given honorable mention.

In case of a tie, each winning contestant will receive the full cash prize to which he or she is entitled.

The winners will be announced in the September issue.

Only the farmers or members of the farm family, to whom this magazine was sent, are eligible.

Only one title may be submitted.

Use the form below or write your answers on a plain sheet of paper in similar form.

Contestants must answer question (a).

Write plainly and send your suggestions to the Title Editor, ELECTRICITY ON THE FARM, 24 W. 40th St., New York, before August 1.

My title for the July Front Cover picture of ELECTRICITY ON THE FARM is.....

.....

.....

.....

.....

.....

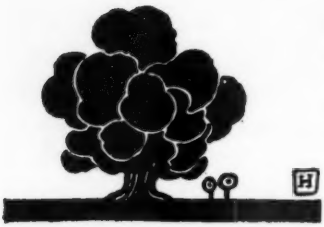
(a) Check where you buy your electric lamp bulbs:

Hardware Store ..... ☐
Electric Contractor ..... ☐
Power Company ..... ☐
Drug Store ..... ☐
Grocery Store ..... ☐

Is it the nearest store to your home from which you can buy them? .....

Name ..... R. F. D.....

Post Office..... County..... State.....



Under The CHESTNUT TREE

Reason for Joy

Mrs. Blabber: "You're looking very happy this morning. Have you had good news?"

Mrs. Gabber: "Just wonderful! My husband has just had a nervous breakdown and we're going to California."

Presto Chango!

"Another magician," said the traffic cop as he watched the man turn the flivver into a lamppost.

Perspective

Timid Wife (to Husband who has just fallen asleep at the wheel): "I don't mean to dictate to you, George, but isn't that billboard coming at us awfully fast?"

New Thrill

He placed an arm around her waist,
And on her lips a kiss,
Then sighed: "It's many a draught I've had,
But not from a mug like this!"

"Have you appeared as a witness in a suit before?"

"Of course."

"What suit was it?"

"My old blue serge."

True

Visitor: "What sort of a man are you going to be when you get out of prison?"

Convict: "An old one, lady."

Isn't It the Truth?

Motorists get into trouble nowadays, not in trying to keep up with the Joneses but in trying to pass them.

No Horn Needed

An easterner on a visit to the West decided to go horseback riding. The hostler who was to attend him asked: "Do you prefer an English saddle or a western?

"What's the difference?" he asked.

"The western saddle has a horn," replied the attendant.

"I don't think I'll need the horn," said the easterner, "I don't intend to ride in heavy traffic."

Exactly!

We watched a salesman demonstrate a new car to a sweet young thing. She said, "What's the handle for?"

He answered: "That's the brake. You can put that on quickly in an emergency."

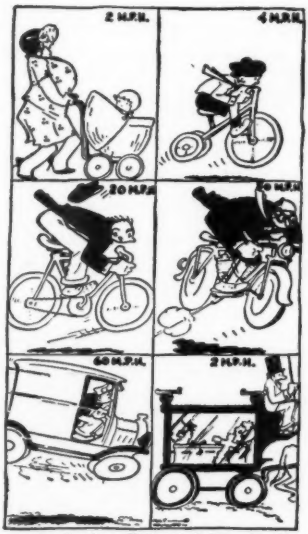
"Oh!" she said, "just like a kimono."

Define a Nut and Bolt

Here's what she wrote: "A bolt is a thing like a stick of hard metal, such as iron, with a square bunch on one end and a lot of scratching wound around the other end. A nut is similar to the bolt only just the opposite, being a hole in a chunk of iron sawed off short with wrinkles around the inside of the hole."

"And how is your husband getting on with his reducing exercises, Mrs. Neuquids?"

"You'd be surprised—that battleship he had tattooed on his chest is now only a rowboat."



Courtesy National Safety Council

The Speedometer of Life

ELECTRICITY ON THE FARM

Spray Cows for Lice

For cattle that are infected with lice, probably the best treatment, according to A. E. Perkins, dairy husbandryman at Ohio Experiment Station, is a thorough spraying with a non-poisonous disinfectant. The solution should be comfortably warm and applied on a warm day so that the animals will not be chilled.

Several satisfactory coal tar derivatives will be obtainable on the market, or the liquid known by druggists as "liquor cresolis compositus" may be used. Any of these may be mixed with 30 to 50 parts of water, according to directions, and applied with a sprayer.

A kerosene emulsion is also effective. This is made by dissolving a quart of soft soap or one-fourth of hard soap in two quarts of boiling water and adding one pint of kerosene. This is thoroughly mixed by churning or pumping through the sprayer, after which three quarts of water are added and mixed, making the emulsion ready for use.

To insure permanent results, the stalls should also be treated thoroughly with the disinfectant solution. Ten days after the first application it should be repeated again to catch any lice that may have escaped. Up-to-date stalls and stanchions will make spraying more effective, as they are easily kept clean and have few cracks and crannies to harbor lice.

Any sprayer which is of proper size may be used. Ordinarily a small hand sprayer of the type used to spray flies will be large enough.

PUMPING PROBLEMS
BANISHED!

With the new Stover Electric Pump Jack you can pump water by electricity. Convenient, quiet, foolproof. A small, compact, powerful, motor driven unit.

STOVER
ELECTRIC
PUMP JACK

Direct connected, gear driven motor. ¼ or 1/3 H. P. Write today for our latest catalog on Pump Jacks and other electric driven machinery.

Stover Mfg. & Engine Co.
Electric Driven Farm Machinery
171 Lake Street Freeport, Ill.
Established 1862

Also Makers of Windmills, Feed Mills, Engines, Corn Shellers, Saw Frames, etc.

The
Inside Back Cover
is for your
convenience
Why not use it?

BUY DURO NOW

THE DURO COMPANY
537 E. Monument Ave., Dayton, Ohio

DURO
Automatic Water Systems

More Praise

We have had an electrical refrigerator for two and one-half years and could not do without it. We have kept cream sweet in it for seven days. We have it set at 38 degrees. It is ideal for keeping cream, butter, meat and leftovers sweet and fresh. We have kept meat fresh for two weeks. I churn all our butter and the refrigerator cools the cream to the right temperature. There is no muss with ice to be hauled in with this electrical servant.

MRS. A. C. OLSON,
Newhall, Iowa.

My Dream Came True

Now, is there any sane person who would care to have a farm without electricity if it was possible at all to have the service? It isn't so long ago that the farmer and his family in this Grande Ronde Valley were not privileged along with the townspeople to have the aid of this wonderful servant due to the difference in the rural and municipal rates for current. Only one year ago, I was dreaming of an electric range but it seemed such a remote possibility that I could calmly pass it by. Dreams do come true and this one has.

Shall I tell in how many ways electricity helps us? Of course we have lights and an automatic pump which supplies all of the water for both house and barn and some irrigation—for two or three months we have to water nearly a hundred head of cattle at the barn. The new chicken house is wired to supply light for the hens in the winter time and heat for the brooder in the spring. If you enjoy raising chickens, one does enjoy it more with the electric brooder.

Step right into our large old-fashioned kitchen and it's lucky that it is large or where should we have put the large mechanical refrigerator, since we have an electric washing machine, a combination range with a large oven and dish washer, and the other necessary equipment (one other piece that is large but some day we hope for an ironer when the power company is able to reduce its rates another step). From the cupboard I can bring forth a toaster, a waffle iron, percolator, corn popper, a grill and an iron. In the bath room we have a small heater, and a curling iron, for the bedrooms an electric pad and the vacuum cleaner for them and the living rooms and for the entire house a radio operated by current.

Labor Savers All

Of course the new range makes cooking more satisfactory, the washing machine is a necessity, the vacuum cleaner saves labor and annoyance, the refrigerator saves food and steps and makes the meals more palatable, but I must not close without eulogizing my dishwasher. I hate dirty dishes but who doesn't! The time spent to make them clean and shining is more often than not, pure drudgery. One evening my husband who was reading a magazine found an article on dishwashers, which he read aloud to me. I think his conscience must have been hurting him because he was not helping with the dishes which I was doing. I am glad he didn't help that time because now I have the dishwasher and it took only one white face bull to pay for it. The day it arrived I think I must have felt like slaves do when the shackles of bondage are loosened.

All of us appreciate your magazine.

STELLA HUNTER ZURBRICK,
La Grande, Oregon.

CLASSIFIED ADVERTISING

The LYON ELECTRIC COMPANY manufacture electric poultry equipment exclusively. Long, practical experience in the highly developed California rural electric field enables us to furnish quality devices at reasonable prices. The LYON line includes: Brooders—Incubators — Egg Testers — Burglar, Temperature and Power-off Alarms — Heating Elements—Thermostatic Supplies—Time Switches—Wiring Supplies. Write for catalog today. LYON ELECTRIC COMPANY, 2075 Moore Street, San Diego, California.

MERCHANDISING SUPPLEMENT
Electricity on the Farm

Vol. 4 JULY, 1931 No. 7

REACHING YOUR PROSPECTS Many rural electrical dealers have found county fairs, as well as some state fairs, effective means for reaching prospective rural customers. An attractively arranged exhibit at a fair always proves a drawing card and results in developing interest on the part of those farmers who have not received electric service as well as those who have already been connected up. Another advantage of the fair exhibit is that the customer as well as the other members of his family are apt to visit it at one time.

But it is essential to stage demonstrations of the equipment shown if the maximum effectiveness of the exhibit is to be secured. An electric refrigerator always proves a point of interest, particularly when the results of its work can be displayed. Electrically operated equipment such as milk separators, churns, ice cream freezers, kitchen and household appliances, as well as some of the large farm equipment such as feed grinders, etc., should be included.

Attention to the wiring end of the business is also necessary so that the customer may feel that he can secure information on electrical installations in addition to equipment.

As usual, ELECTRICITY ON THE FARM will issue a special Fair Number, to be published under date of September, and which will receive wide circulation among prospective as well as present customers of Power Companies. It will aid materially in creating interest in electrified farm equipment.

SALES PROBLEMS OF THE RURAL SERVICE MAN

By MAX G. HOAGLAND

IN 1893 Mr. E. L. Brown who operated an electric generating station at Elmwood, constructed a transmission line to Yates City, a distance of three miles. This was a 1,100 volt line, single phase, and giving 133 cycle service. To this line they connected four farm customers who were unquestionably the first strictly rural customers to be served from a transmission line in the United States. The farms were connected with a 10 light, dry type transformer, and when 10 years later, two more farmers were connected to the line, the Company had decided that a five light transformer would provide enough capacity for this type of service. There were no meters, and the customers paid for the service on the basis of:

85¢ for the first socket
75¢ for the second socket
65¢ each for the next three sockets
50¢ each for all over five sockets

The service was from dusk until midnight, and 5 A.M., until dawn.

Primarily Salesmen

Regardless of whether our title is Rural Engineer, Service man, or Salesman, if we are working with a Utility Company on rural electrification at the present time, we are primarily Salesmen. Whether we entered into this work with the idea of becoming a salesman is immaterial, since Rural Electrification has so developed that at the present time what it needs most is a lot of selling. It has been proven that the extension of electric service to Illinois farms is economically practical. There are now sufficient uses and equipment developed that any Illinois farmer can electrify his farm to the material advantage of himself, and the Utility rendering the service. Unquestionably there will always be a field for investigational work, but the rapidity with which the entire field will be developed depends on the number of farmers to whom we are immediately able to sell this service, and the completeness with which we equip these electrified farms.

Specialized Knowledge

The selling of complete farm electric service requires an individual of considerably more specialized knowledge and sales ability than many other selling jobs. And since we directly are responsible for the future development of farm electrification in this State, and since no one can deny that we have a tough job of selling ahead of us, we are justified in taking a real pride in the success we experience in bringing this service to the farmer.

Let's think which problems are characteristic or peculiar to our particular job.

In the first place we are selling about 50 different products, from high line service, to poultry brooders, and other equipment, each one of which is a sales line in itself. We have to learn a sales talk for each of these different sales, whereas you could spend the rest of your life studying washing machines, or any one appliance and constantly improve your presentation. Some men may not directly sell equipment to farmers, but whether these sales are handled by the rural department, or the town merchandise salesman, the farmer usually buys equipment as a result of the efforts

*Abstract of paper presented at the Rural Electrification Short Course at University of Illinois.

of the rural department, and it is ourselves who are responsible for K.W.H. consumption per customer. Consequently, it is necessary for us to study constantly, and take all advantage of such meetings as it is possible for us to attend, to supply us with enough ammunition to even discuss intelligently all the things we have to sell.

Confidence of Customer

The fact that we are selling a number of products, and since our work with a customer is just starting when a new line is extended, makes it extremely important that the customer have absolute confidence in our knowledge and sincerity. If we can sell the farmer confidence in ourselves, he will install equipment on our recommendation without having to be resold every time he adds an appliance.

Another characteristic of our job is that especially in the promotion of new extensions, we are usually selling a group of farmers instead of individuals. Where a group is sold successfully a meeting is usually held of the prospects, as a result of inquiries for service. The salesman's greatest help in this group selling is the influence of the prospects, who have decided they want service, with their neighbors who are undecided. It is also important to sign up as many customers as possible at meetings where this influence is paramount, and where it is difficult for a prospect who is not anxious for service to think individually. We should utilize to as great an extent as possible the help of the farmers who are anxious for service, but must take the initiative ourselves in closing up the line. We cannot leave it all up to the farmer for the line must be closed as soon as possible. If a customer signs up for service, and must wait 6 months for the others to sign, he loses much of his enthusiasm before he is connected.

A real problem with which we must contend is the difficulty of getting any number of interviews in, in a day's work. The duties of the rural salesman are so numerous and varied, and the miles to be covered so great, that unless we exert a constant effort to keep our work organized, we can spend about 90% of our time touring the country and have nothing of consequence to show for the day's effort. The solution here is organization and planning of our work. The later it is in the day, the greater the possibility of securing a satisfactory interview with the farmer. Consequently it is usually better to take care of our office work in the morning, and work as late in the evening as our ambition inspires us to. When you drive ten miles to an evening appointment with a farmer, and his wife, they are at least obligated to give you a good audience, and their appreciation of the effort you have made for their benefit, will help materially in securing a contract.

Ready to Cooperate

Examples of what farmers have paid to bring electricity to their farm illustrate what this service may be worth, and these men are not millionaires with a farm for a plaything, but are earing their living on their farms. One farmer near Augusta, Illinois, guaranteed $10 a month and paid $1,000 toward the cost of the extension. Another farmer paid $1,145 toward the line cost to secure this service. A farmer near Decatur, Illinois guaranteed $60.00 per month, and his bill now will average over $100 per month. So regardless of what it may cost to electrify a farm, any one who inquiries should be given the cost and in a manner which assures him it is worth the money.

In spite of the rapid development of rural service in the past few years, we are still missionary salesmen developing a new class of business for our employees. Probably there is yet a majority of farmers who can not conceive their own farm and home being electrified even if they have heard of this development. Consequently, we are presented with countless opportunities for becoming discouraged. We have all gone a

month or more without securing any business. We have prospective lines on which we have spent much time, and which we need one or two additional contracts to get the extension approved. In order for us to keep working harder when it is discouraging, we must have a personal philosophy for support. We know that no matter what you are selling, if you see enough people, and tell your story enough times, someone is going to buy. The success we experience depends upon how hard we work, and how good our story is. The only thing we can expect with certainly is that everyone will not buy. So we try constantly to improve our presentation, and when it is tough for a time, it is necessary that instead of accepting the dearth of contracts as inevitable, to redouble our efforts and get to "clicking" before we're out of a job.

One rural salesman connected 210 new customers and sold 37 ranges and 22 refrigerators; another man connected 90 customers and sold 44 ranges and 15 refrigerators; another salesman contracted 190 customers and sold 32 ranges and 20 refrigerators in the first seven months of last year.

Ranges Lead Sales

I believe we are selling more ranges than refrigerators to our farm customers only because of greater emphasis having been placed on the merchandising of the electric range. The refrigerator is, if anything a more needed piece of equipment than the range on the average farm, and the revenue of the refrigerator is as great since most farmers do not use their electric range during the winter months.

It is evident that our job can and is being done. We have seen the development of farm electric service progress so as to make it continually easier to sell this service in volume. The farmers have an increasing appreciation of the higher standard of living which is the big thing the high line brings. In one territory in which there are about 500 farm customers, there were sold in 1926, 10 ranges and 2 refrigerators; in 1927 there were 35 sales of these appliances; while in 1928 with probably little more effort being exerted than in the previous years, 80 farmers purchased an electric range, and 50 customers installed refrigerators.

Farm organizations are taking an increasing interest in rural electrification. Companies are advertising this class of service more each year, and new uses for the service which further enhance its value, are continuously being developed. We will sell more farm electrification in 1931 than has been sold in any previous year.

Rural Business Meeting of Empire State Gas & Electric Ass'n.

The Rural Business Committee meeting, under the auspices of the Rural Business Com., Empire State Gas & Electric Association, was held at the New York Experiment Station, at Geneva, N. Y., on June 3rd.

Many interesting reports were presented among which were the following: Report of the Farm shop committee, by R. G. Harvey; the Farm Wiring Committee, by H. C. Fuller; stationary spray plants for the control of orchard insects and diseases, by F. M. Wigsten. Dr. A. C. Dahlberg of the Dairy Department of the Geneva Experiment Station described a dry air sterilizer now in use; W. W. Jurden presented details on the effectiveness of the Oberdorfer dairy utensil scalder in which five gallons of water can be heated to 180 degrees in an hour using a 2 kw. heater. M. S. Lloyd reported on several prospects in the western division of the Niagara Hudson system.

The committee were the guests of the Empire State Gas & Electric Company at a luncheon at the Hotel Seneca. In the afternoon, miscellaneous discussions were presented and an inspection was made of the Experiment Station's buildings and grounds.

RURAL ELECTRIFICATION Salesmen's Forum

Conducted by TRUMAN E. HIENTON

Threshing of Grain

AVAILABLE figures indicate that, for threshing the grain and filling the silos during 1924 in the United States, 928,400,000 kilowatt-hours would have been required if the power had been furnished by electric motors.

These two major farm machines, the thresher and silage cutter, together utilized between 25 and 30 per cent of all energy consumed in stationary work done on farms during that year, according to figures contained in U. S. D. A. Department Bulletin 1348 and the statistical summary of the 1925 U. S. Census of Agriculture.

The figures used to determine the total energy consumption given were based on the fact that 1,200,000,000 horsepower-hours were required for threshing and that 28,407,960 tons of corn were cut for silage. The energy consumption then for threshing would approximate 900,000,000 kilowatt-hours and that for silage cutting 28,400,000 kilowatt-hours based on the estimate of one kilowatt-hour per ton of silage.

An Enormous Market

The enormous market for power indicated in the totals previously mentioned has been of interest to power companies. There has been, to be sure, a reduction during the past six years in the amount of threshing done by stationary machines and also a smaller number of silos filled. However, while the combine-harvester will continue to reduce the amount of grain threshed by the stationary type of thresher, it is very doubtful whether it can ever entirely supplant that type of machine. Figures reported in U. S. D. A. technical bulletin No. 70 state that "For small acreages the expense of harvesting with a combine is greater than with either a binder or a header. Where 60 or more acres are to be harvested with a binder, or 100 or more with a header, the small combine may prove more economical than these machines." It would seem that unless the combine can be considerably reduced in price, that the thresher will continue to be used, if for no other reason than that of an economic one.

Studying Small Threshers

Power companies and agricultural engineers with several of the various state agricultural experiment stations have been engaged during the past seven years in studying the possibilities of operating small threshers with electric motors. Investigational work has been conducted by the Northern States Power Company of Minneapolis under the direction of Mr. C. P. Wagner and by the Detroit Edison Company under Mr. Douglas Dow's direction. Prof. E. A. Stewart, formerly of the University of Minnesota, Prof. Harry L. Garver of Washington State College, and the author at Purdue University have investigated the operation of threshers with electric power at the agricultural experiment stations in their respective states.

Prior to the initiation of these studies, efforts had been made to develop the load offered in operating the thresher by a few power companies. The belief in the necessity for using a motor of 15-horsepower or greater capacity lim-

ited such use to that of a community motor or to one owned by a power company. Two companies, one located at Noblesville and the other at Madison, pioneered this development in Indiana. A 15-horsepower, single-phase, 220-volt motor owned by the Noblesville company was rented out to farm customers of the company during 1914 and 1915 to operate the threshing machines and other large machinery on their farms. The Madison company provided a small group of its farm customers with a 25-horsepower, 3-phase, 2300-volt motor in 1921 for operating a thresher, and this motor was also used for two seasons.

The Red Wing line which has become internationally known as the first experimental electric line, was the scene of much experimental work originated by Prof. E. A. Stewart while at the University of Minnesota. The investigational work was carried on there beginning in 1924 and lasting through 1927. In the first work carried on, a 15-horsepower, single-phase motor was used to operate a 22x36-inch separator. Ensuing tests included the use of three motors of various sizes to drive the thresher, and the final arrangement resulted in employing a 10-horsepower motor to drive the cylinder and straw racks, a 3-horsepower motor the stacker fan, and a 1.5-horsepower motor to operate the grain shoe, fan, and grain auger.

A special 22x36-inch thresher equipped with roller bearings was used during 1926 and 1927 with an 11 per cent reduction in power requirement below the old style machine. The average demand of the motors during all threshing reported for 1927 was 11.9 kilowatts. This outfit during the 1927 season threshed from 51.1 to 150.0 bushels of oats per hour, barley, 75.2 to 114.0 bushels per hour, and winter wheat 52.7 to 71.2 bushels per hour.

Conclusions reached by agricultural engineers of the University of Minnesota agricultural experiment station regarding these tests are included in a recent publication of that station. These are:

"Threshing by electric motors is feasible and economical."

"Three motors give better results than one motor alone."

"The cost of electricity at 3

Threshing wheat with 10-H.P. electric motor operating a 20 x 32-inch separator on a Tippecanoe County, Indiana, farm, July, 1929

cents per kilowatt-hour is about the same as the cost for kerosene and oil, with good engine operation."

"Time can be saved during threshing by using electricity so as to increase the total amount threshed per day."

"It is highly important that grain be threshed when in good condition if the costs are to be at a minimum."

"A roller-bearing threshing machine requires less power and less energy than does a plain bearing machine of the same size and make."

Tests were conducted during 1929 by C. P. Wagner of the Northern States Power Company using three motors, one of 7.5-horsepower, a second of 3-horsepower, and a third of 2-horsepower capacity to operate respectively the cylinder, shaker, and wind stacker of a 21x36-inch thresher. The speed of the wind stacker during the threshing tests was reduced from the manufacturer's rating of 830 to 688 r.p.m. with satisfactory operation resulting. In one test of 6.3 hours duration an average capacity of 68.6 bushels of barley per hour was threshed with a slight overload on the motors, according to a report on "Rural Electrical Threshing Experiments," made by Mr. Wagner. The average power demand of the motors during this test was 10.9 kilowatts. Approximately two-thirds of the power requirement is needed to operate the machine empty, according to Mr. Wagner's figures.

An Enthusiastic Farmer

The successful operation of a 20x32-inch thresher with web stacker and without self-feeder by a 5-horsepower motor was reported in the July, 1929 issue of ELECTRICITY ON THE FARM by E. R. Meacham. The farmer, who was a rural customer of the Wisconsin Power and Light Company, was so enthusiastic over the operation of this thresher with the motor that he wished to add a wind stacker to his machine at once. One of Mr. Meacham's rural service men, realizing the added power requirement of the wind stacker, induced him to use a 7.5-horsepower motor instead of the 5-horsepower one to operate the thresher with the added equipment.

During the same season Prof. Harry L. Garver of Washington State College used a single motor of 10-horsepower capacity to operate a 20x28-inch thresher for threshing barley and oats and wheat. A capacity of 60 bushels of barley per hour was obtained with a power demand by the motor of 8.5 kilowatts.

Detroit Edison Tests

To determine the possibility of using several utility motors to operate one thresher, Mr. Douglas Dow of the Detroit Edison Company undertook some tests during August, 1929. As a result of the work conducted this power company in the latest edition of its farm book states that "A 20- or 22-inch separator can be successfully operated with three 5-horsepower motors."

Efforts to determine the minimum size of motor required by a small standard thresher were undertaken at Purdue University by the author in July, 1929. A 10-horsepower, single-phase motor was used to operate a 20-32-inch thresher. Tests were made with this outfit for threshing wheat, oats, and soybeans. An average power output of 12.4 horsepower was used while threshing wheat at a rate of 48.8 bushels per hour and 11.4 horsepower while threshing oats at the rate of 88.9 bushels per hour. The motor, while overloaded 24 per cent in threshing wheat and 14 per cent in threshing oats, at no time was stopped by the thermal overload relay. Two tests were conducted with soybeans, one in which the stacker fan speed was about the same as that for wheat and oats and the other reduced about 350 r.p.m. The average power output of the motor in the first case was 11.1 horsepower and in the second, 7.2 horsepower, while the capacity decreased only slightly, from 42.0 to 36.2 bushels of soybeans per hour.

The remarkable drop in power requirement of the motor follow-

Minimum Silage Cutter Speeds

Table of cutter speeds for most efficient operation for different sized elevating fans and for silos of different heights.

Diameter of Cutter Fan	Height of Silo 25′	30′	35′	40′	45′	50′	55′	60′	75′
	Revolutions per minute of cutter fan								
36″	415	440	480	510	540	575	600	625	695
38″	390	415	450	480	510	545	570	595	660
40″	370	395	430	460	485	515	540	565	625
42″	355	380	410	435	465	490	515	535	595
44″	340	360	390	415	440	470	490	510	570
46″	325	345	375	400	425	450	470	490	545
48″	310	330	360	280	405	430	450	470	520

Note: These speeds are based upon carefully conducted tests with a reasonable allowance to insure uninterrupted elevation. Good cutters will operate at these speeds.

ing the drop in stacker fan speed led to a series of tests in 1930 to determine the effect on power demands by threshers of a variation in stacker fan speeds. The table on page 10 includes results of 1929 and 1930 tests. It will be noted especially in the 1930 wheat threshing tests, that a decrease in stacker fan speed was accompanied by a corresponding reduction in power demand of the thresher, 13.6 horsepower demand with a stacker fan speed of 1020 r.p.m., 12.5 horsepower with 840 r.p.m., and 11.7 horsepower with 755 r.p.m. It was found possible to thresh oats successfully with a stacker fan speed less than that practical to use with wheat. It will also be seen that in all tests of oat threshing, the average overload on the motor was insufficient to be of any concern in operation, for in one case the power demand was only 9.4 horsepower.

Motor Operation of Threshing Machines Practical

It is apparent from the tests conducted by the various agencies that it is entirely practical to operate threshing machines with one or more motors. It would also seem that the power demand of the thresher might be readily reduced by a drop in stacker fan speed and possibly through other changes.

The advisability of adding loads of the type described as used for threshing is one which any individual power company must determine for itself. At the present time some thresher manufacturers are very much interested in the possibility of electric motor operation of their machines. All manufacturing companies should be interested in it as well as the possibility of reducing power demands of their machines.

Experimental work on the operation of silage cutters with electric power has, on the other hand, been of more immediate value in fostering the use of small motors than has that with the threshing machine. The use of a 5- or 7.5-horsepower motor to operate the silage cutter is today accepted by manufacturers, power companies, and many farmers as a reality. Farmers who have filled their silos for the past three or four years using electric power to operate their silage cutters are real boosters for the motor-driven cutter.

The general acceptance of the motor for driving silage cutters by agricultural engineers of state universities is best determined by an examination of publications issued by them on that subject. Bulletins or circulars treating primarily the operation of the silage cutter with a motor have been issued by three state universities: Michigan, Nebraska, and Purdue. Results of experiments conducted have also been printed by universities of other states as follows: Cornell (New York), Illinois, Minnesota, Missouri, Ohio. Pennsylvania, and Wisconsin. To one institution, and more especially to one man, Prof. F. W. Duffee of the University of Wisconsin, belongs the credit for the pioneering of research work on

the power requirement of the silage cutter.

The reports of the various experiments are in general agreement on sizes of motors required for various sizes of cutters and certain factors to be observed for successful operation.

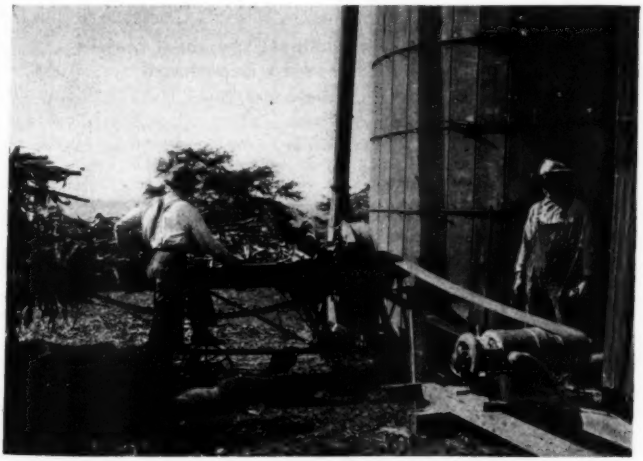
The disk or flywheel cutter in which the knives are fastened to the fan and revolve with it as a unit is the most common type and used most extensively. The size of the cutter is usually designated by the throat width in inches, and while it denotes only one dimension as far as size of throat opening is concerned, it is the one generally remembered by the farmer.

Professor Duffee prefers to use the throat opening as the size of the cutter, but since the majority of reports are made on throat width that method is used. It has been found that the 12 or 13-inch cutter is best suited for use with the 5-horsepower motor. Cutters of larger throat widths may be used where the height of elevation is not great but only with careful feeding.

The speed of the cutter should be as slow as will elevate the corn into the silo at full load, since excessive speeds result in increased power demand. Many cutters of older design will not elevate at speeds as slow as the newer cutters and should be operated at speeds in excess of those recommended in an accompanying table prepared by Professor Duffee and included in Circular 174 of Purdue University.

Operating Requirements

Additional items which should be recommended for the best operation of the cutter are the use of sharp knives, proper clearance of fan wings, and the use of a shear plate with a good edge. Sharp knives should be used, generally changing them twice daily, usually at noon and at the start of the day's work. They should be kept properly adjusted with regard to the sheer plate, against which they cut, running as closely to it as possible without striking it. The shear plate should be replaced, or reversed if possible, when the edge becomes worn or rounded off. Clearance at tips of fan wings should not exceed ⅛ inch and at the side not over ½ inch. Another factor of extreme importance to the farmer is one which power company representatives should



The 5 or 7.5 H.P. motor is being used extensively for silo filling. Farmers employing motors for this work are pleased with results obtained.

check, namely that of adequate voltage at the motor.

Figures reported indicate that from 3 to 10 tons of silage may be cut per hour with a 5-horsepower motor. Energy required averages about one kilowatt-hour per ton, although some variation is noted above and below this figure.

An Interesting Comparison

A striking illustration of the use of electric and tractor power came to the attention of the writer a few years ago when a farmer operated his 13-inch cutter with a 5-horsepower motor for the first time. He used 99 kilowatt-hours to fill his silo, which was 12x42 feet in size. The preceding year a tractor was rented to operate the cutter at a cost of $1.75 per hour and fuel. The fuel cost exceeded slightly the cost of the electric energy and the rental charge amounted to $21.00, so that the farmer felt that he had made a decided saving in using his motor. The same silo was filled by the use of electric power again in 1929 and 1930.

An answer to the problem of the farmer who had a tractor and wishes to use a motor to operate his cutter had been furnished on the farm of H. P. Miller and Son Sunbury, Ohio, where the tractor is used to pull the corn binder which is equipped with a bundle loader and thus reduces the size of crew required for the silo filling task.

An important place is occupied by the silage cutter in the control of the corn borer for, according to Circular No. 132 of the U. S. Dept. of Agriculture, "when the corn plant is ensiled the larvae are killed by the mechanical action of the silo filler or by fermentation in the silo." This should be of particular interest to power companies and dealers located in corn-borer infested areas.

Publications containing information on the subjects of threshing or silage cutting with electric power follow:

"The Red Wing Project on Utilization of Electricity in Agriculture." Univ. of Minnesota, Ag. Exp. Station, Univ. Farm, St. Paul, Minnesota.

"Silo Filling with Five-Horsepower Electric Motor," Ext. Bull. No. 87, Michigan State College, East, Lansing, Michigan.

"The Use of Electricity on Mis-

(*Continued on page* S15)

Purdue University Agricultural Experiment Station
Agricultural Engineering Department

Tests of Threshing Machine to Determine Power Demands, 1929

Grain Threshed	Wheat	Oats	Soybeans	Soybeans
Bushels per hr.	48.8	88.9	42.0	36.2
Kw.-hr. per 100 bu.	23.2	11.7	24.1	18.2
Av. power output of motor—hp.	12.4	11.4	11.1	7.2
Stacker fan speed*	940	940	980	630

*No-load speed.

Tests of Threshing Machine to Determine Variation in Power Demands by Reducing Stacker Fan Speed, 1930

Grain Threshed	Wheat	Wheat	Wheat	Oats	Oats	Oats	Oats
Bushels per hr.	56.8	74.5	57.1	156.5	157.0	149.3	120.6
Kw.-hr. per 100 bu.	21.7	15.3	18.7	5.4	5.8	6.6	7.9
Ave. power output of motor—hp.	13.6	12.5	11.7	9.4	10.0	10.8	10.5
Stacker fan speed*	1,020	840	755	785	695	695	695-615

*No-load speed.

By H. S. HINRICHS

THE increasing use of electric motors on the farm emphasizes the importance of a correct wiring installation in order that the motor can effectively perform the task assigned to it. Many power uses on the farm are of a fluctuating character: i.e., the demand for power varies widely during any given interval of time. The characteristics of an electric motor, particularly its overload capacity, make it practicable to use a motor having a smaller rating than that required for the maximum loads, *provided* that the wiring is large enough to supply the motor with ample current at proper voltage during such momentary peak loads.

Errors in Wire Size

A recent investigation of a complaint of poor motor operation revealed the fact that No. 8 wire was used to serve two 3 H.P., 220 volt, single phase, 1800 R.P.M. motors approximately 400 feet from the service switch. This particular situation affords an excellent illustration of how incorrect calculations for wire size are sometimes made.

This contractor found that a 3 H.P. motor having the above specifications had a full loading rating of 13.4 amperes. Two motors would then have 26.8 amperes. Since No. 10 wire has an allowable current carrying capacity of 25 amperes, the smallest allowable size of wire was No. 8 (allowable capacity 35 amp.)

The first factor which was overlooked in these calculations, was that the starting current of such motors is approximately 200% of the full load, running current. Since one of the motors started automatically while the other was in operation, the actual demand at such period was — 13.4 amperes for the motor in operation plus approximately 26.8 amperes for the one just starting — or a total of 50.2 amperes. While this starting load continued for a brief period only, it was of sufficient duration to blow the 35 ampere fuses protecting the circuit.

The second and more important factor overlooked, however, was that of the voltage drop or loss in the line due to the distance from the service switch. The best practice for motor circuits recommends that this loss be held to 5% or less.

Taking into account these two factors, the wire used for the installation given as an example should have been No. 4; the voltage drop for the number 8 wire would have been 26 volts or 11.8%, leaving a net of 194 volts if the voltage were normally at 220 under no load.

Calculating Voltage Drop

For those unfamiliar with the method of calculating voltage drop, perhaps the easiest way of becoming familiar with it, is the use of current—voltage drop tables which can be found in most handbooks. For such a table, the reader is particularly referred to Page 39 of "Wiring the Farm for Light, Heat, Hand Power," a publication issued by the National Committee on the Relation of Electricity to Agriculture, 1120 Garland Building, Chicago, Illinois, and designated as Bulletin No. 1, Volume 5.

One formula for determining proper size of wire:

$$\text{Circular Mills} = \frac{\text{Distance} \times 2 \times 10.7 \times \text{Amperes}}{\text{Volts Lost}}$$

The circular mills equivalent for the common wire sizes are:

Wire Size B & S Gauge	Circular Mills
14	4,107
12	6,530
10	10,381
8	16,509
6	26,251
4	41,742
2	66,373

Anyone installing the wiring for motors should by all means remember these two important factors, viz:

1. That the starting current of single phase motors is approximately twice the running current and the wiring must take that into account.
2. That the distance between the transformer and the load must be taken into account as well as the actual current carrying capacity of the wire.

"The same persons who so loudly proclaimed a new era of unlimited prosperity two or three years ago are now equally convinced that the end of civilization is at hand and that while time still remains we had better sell the whole country back to the Indians for what it will bring."

At the N. E. L. A. Convention

The ELECTRICITY ON THE FARM booths, spaces 422-24, were Rural Electrification Headquarters at the big Atlantic City Convention. Here those interested in farm electrification had opportunity to visit and discuss rural development problems. The reception accorded us by leaders in the industry was highly gratifying.

Another exhibit at the Convention of particular interest to farm-minded power company representatives was the Benjamin display of angle and dome reflectors. This company is putting on the market special farm packages, one with a dome reflector and wall bracket and another with an angle reflector and wall bracket, which should prove very popular. These packages will simplify the stocking and merchandising of reflectors for which there are so many applications on electrified farms.

Westinghouse also had a farm section in their large display, showing a water system, chore motor, and a home lighting set. In the General Electric exhibit a G-E four-can milk cooler was included. Of course all the household appliances that find application in farm homes as well as urban were shown by the leading manufacturers.

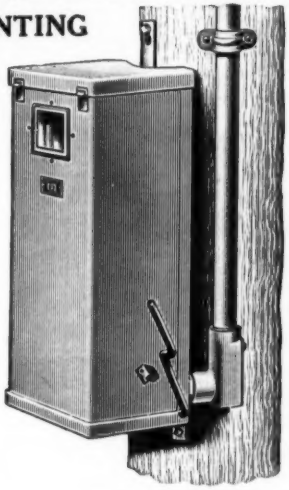
Rural Electrification Headquarters at the National Electric Light Association Exhibit

Notice the Curved Back

MAKES POLE MOUNTING

Economical and Practical

The back of the "UTILITY" Meter Box is curved. It fits snugly whether the pole is large or small. Door is arranged so as to give unusually easy access to contents when the cabinet is opened.



"UTILITY"

Meter Boxes and Meter Service Switches

are adaptable to a wide variety of installation requirements and permit economical wiring. In spite of their many advantages, cost compares favorably with wooden boxes. Thousands in use.

Write for Illustrated Catalog—

and full information about our free trial offer. There is no obligation.

F. D. KEES MFG. CO.

Beatrice, Nebraska

Blue Ribbon Electric Milker

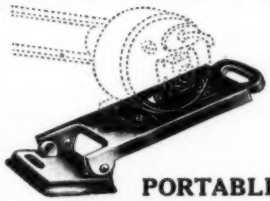
A Portable Milker Requiring No Installation

The "Blue Ribbon" is a self-contained milker, requiring no pipe lines or extra equipment of any kind. It operates direct from the light socket of either high line or farm light plant. A beautiful catalog and complete information will be sent on request. Write us today.

Electric Products Corporation

7 Bluff Ave., La Grange, Ill.

BRILLION-BEVAN



PORTABLE MOTOR BASE

With it you can use one motor to operate your grinder, washing machine, vacuum pump sausage grinder, line shaft, or any other installation which requires ½ H.P. or less to drive it. Write for prices.

One feature of high-grade line of Electric Farm Equipment.

ELECTRIC PUMPERS — PUMP JACKS — WATER SYSTEMS — GRINDERS

BRILLION IRON WORKS

Brillion, Wis.

BOB'S PAGE

Devoted to Merchandising of Electrical Equipment in Rural Communities

Conducted by Robt. J. Fulton

Selling Your Prospect

ELECTRIC motors must be sold now. You must take them out to the farmer—you cannot wait until he comes to buy them. Until the prospect knows just where, when and how electric motors are going to be of benefit to him, you will not be able to sell them to him. As he does not know of all the advantages of electric motors it is up to you to sell him.

Remember that the prospect does not buy because the salesman wants him to, but because he wants to buy. Your job, as a salesman, is to get your prospect to want electric motors—the decision to buy is always up to him. You do not sell the prospect, you simply help him sell himself. Therefore you must get his viewpoint. This puts you on the prospect's side and establishes a more favorable relationship.

Get Your Prospect

Your prospect is always more interested in the service that can be obtained than in the price. Service is always with him—price is incidental. For this reason you must "paint" in words a picture for the prospect, showing him just how the particular motor or appliance will serve him, or her.

Every successful action or undertaking has a direct or definite goal—the gunner knows his target; the architect knows every nook in his future building; the successful salesman chooses a straight course in his sales talks, the route of which includes the prospect's most responsive spot, and the goal, his desire to buy.

Diplomatic questions often uncover your prospect's personal interests, thereby determining a sales argument which is logical and making it the one big point of the conversation. As a certain hit is generally responsible for the winning of a ball game, so a certain point followed in the right way makes a sale.

Learn to say the selling price of your appliance or electric motor without hesitation or weakness. If you cannot establish the legitimacy of the price to yourself, you will have a difficult job convincing anyone else of its justification.

Creating the Desire

The art of selling is the creating of the desire on the part of your prospect to possess that which you have. The more you create the desire, the less the price enters into it. If price was a factor in sales today, people would not be buying thousands of vacuum cleaners at $39.50 when brooms can be bought for 69c. Nor would they buy electric toasters at $6.00 when fuel toasters can be bought for 50c or $1.00; or electric irons at $5.50 when sad irons sell for 50c.; or electric fans at $12.00 when palm leaf fans sell for 10c. They would not buy automobiles for $500.00 to $2,000.00 when a horse and buggy costs from $200.00 to $400.00, nor would they buy typewriters at $60.00 when pen and ink costs 20c, if price were the only thing considered.

For this reason in a sale, the service, not the device, must be sold. $75.00 may be a high price for a ¼ HP motor just as a motor, but the shallow well pump that it is on delivers the services that makes $75.00 fade into the background when looked upon as a means of having water at the faucet, thereby eliminating hand pumping, affording fire protection and sanitation. When these points are brought to the fore, the $75.00 does not enter into the picture. It is the service and performance that count most.

Threshing of Grain

(*Continued from page* S10)

souri Farms," Bull. 268, Univ. of Missouri, 9g. Exp. Station, Columbia, Missouri.

"The Use of a Small Electric Motor in Silo Filling," Circular 42, Univ. of Nebraska, Ag. Exp. Station, Lincoln, Nebraska.

"Using Electricity on Ohio Farms," Bull. 96, Ohio State Univ., Ag. Ext. Service, Columbus, Ohio.

"Progress Report on the Use of Small Electric Motors for Cutting Ensilage, Sawing Wood, Grinding Feed," Pennsylvania State College, Ag. Exp. Station, State College, Pennsylvania.

"Operating Ensilage Cutters and Husker-Shredders with Electric Motors," Circular No. 174, Purdue Univ., Ag. Exp. Station, Lafayette, Ind.

"Fighting the Corn Borer with Machinery in the Two-Generation Area," Circular No. 132, U. S. Dept. of Agr., Washington, D. C.

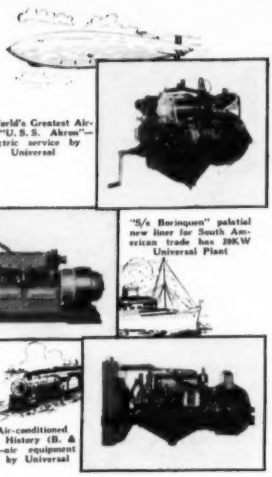
Threshing Machine Manufacturers

Manufacturers of threshing machines include the following:

Advance-Rumely Thresher Co., La Porte, Ind.
Avery Power Machinery Co., Peoria, Ill.
Belle City Mfg. Co., Racine, Wis.
J. I. Case Threshing Machine Co., Racine, Wis.
Huber Mfg. Co., Marion, Ohio.
International Harvester Co., Chicago, Ill.
Minneapolis Steel & Machinery Co., Minneapolis, Minn.
Nichols & Shepard Co., Battle Creek, Mich.
Port Huron Corporation, Port Huron, Michigan.
Wood Bros. Thresher Co., Des Moines, Iowa.

Silage cutter manufacturers include:

Advance-Rumely Thresher Co., La Porte, Ind.
Algoma Foundry & Machine Co., Algoma, Wis.
J. I. Case Threshing Machine Co., Racine, Wisconsin.
Joseph Dick Mfg. Co., Canton, Ohio.
Gehl Bros. Mfg. Co., West Bend, Wis.
International Harvester Co., Chicago, Ill.
Papec Machine Co., Shortsville, N. Y.
I. B. Rowell Co., Waukesha, Wis.


On World's Greatest Airship "U. S. S. Akron"—electric service by Universal
"S/s Borinquen" palatial new liner for South American trade has 200KW Universal Plant
First Air-conditioned Trains in History (B. & O. Ry.)—air equipment powered by Universal

On Land — On Sea — In the Air

UNIVERSAL

meets all requirements

THE installations shown above attest the world-wide esteem in which Universal Electric Plants are held. They are first choice always when the highest quality is a requisite. These plants are especially noted for great dependability and ultra-smoothness. They are extremely quiet, economical and long lasting. Electrical parts are designed and built as units with fine gasoline engines of four, six and eight cylinders. Universal Electric Plants range in size from 1 to 35 KW, AC and DC, in standard and special voltages, in portable, stationary, and marine types.

Complete literature on request to Dept. 42, Universal Motor Company, Oshkosh, Wis., U. S. A.

Universal MOTOR CO. MOTOR COMPANY

Navy Zeppelin Equipped With Universal Plant

The new Navy Zeppelin ZRS 4, now nearing completion at the plant of the Goodyear Zeppelin Corporation at Akron, will be equipped with a specially designed Universal Electric Plant. The plant weighs but 470 pounds and is rated at 8 K.W. with an overload of 3 K.W., a total of 11,000 watts of electric power—enough to light 70 average rooms.

The Navy requirements for the ZRS 4 were very exacting. Absolute reliability, lighter weight than ever before known, compactness, large capacity and extreme durability were demanded of the builders. Much of the metal used in the construction of the Universal Zeppelin Electric plant is a special aluminum alloy of extraordinary strength and lightness. All of the aluminum parts have been especially treated by an electrical process to resist salt air corrosion. Other metal units have likewise been cadmium plated for the same purpose.

In addition to the ZRS 4, several Goodyear airships have Universal electric service, as have airways, steamship lines, etc.

Indiana Electric Light Assn. Meeting Held at Leesburg

The annual spring meeting of the Indiana Electric Light Association was held at the Tippecanoe Lake Country Club, Leesburg, Indiana. The meeting was well attended and many topics were discussed.

It was tentatively agreed that the Purdue Short Course be held on October 8th to 10th inclusive, with the Merchandising Conference on Saturday morning, similar to last year. Plans are under way to make the exhibits at this year's Fair unusually attractive.

A report was presented by Mr. Truman E. Hienton, Project Leader of the Agricultural Engineering Department of Purdue University, on the experimental projects on the "Relation of Electricity to Agriculture." This report is to be revised to include data on Home Economics and it will probably be available for general distribution.

Gold Plated Refrigerator at Henry Ford Museum

Announcement was recently made by the General Electric Company of Schenectady, New York, to the effect that a gold-plated refrigerator, the millionth manufactured by the company, had been presented to Henry Ford by Gerard Swope, president of the General Electric Company, to be exhibited in the Henry Ford Musuem at Detroit, Mich. The General Electric refrigerator was first placed on the market for use four years ago, after many years of study by scientists and engineers to perfect an electric refrigerator.

The presentation of the refrigerator to Mr. Ford was made during a radio program broadcast over the National Broadcasting Company's network.

Trade Literature Received

Hinman Milking Machines—Folder illustrating and describing the Hinman two-cow milker. Because of the extreme simplicity and design, these machines are easily cleaned, are portable, equipped with a G. E. motor, Wearever pail and 20 feet of electric cord.

• • •

Westinghouse Water Systems—A four-page folder describing the Westinghouse Water System Window Display. Contains complete instructions for setting up same. A mysterious touch starter is the leading feature, intended to attract attention and incidentally illustrate the automatic operating features of the system.

• • •

Model S-82 G. E. Refriegrator—The Electric Refrigeration Department of the General Electric Company announces a new domestic refrigerator, model S-82, having 8 cubic feet of food storage space and 13½ square feet of shelf area. The cabinet is of all-steel construction, finished with a sanak exterior and porcelain interior. Four trays, one a Du-Flex rubber tray and three standard metal trays for ice cubes, are provided. The capacity of the trays is 12 pounds of ice or 104 cubes.

COMING MEETINGS

NATIONAL ASSN. OF FARM EQUIPMENT MANUFACTURERS. Thirty-eighth annual convention October 21-23, 1931 at Chicago, Ill.

OHIO STATE SHORT COURSE: State Short Course to be held at Ohio State University, Nov. 5, 6, 7, 1931.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS. (North Atlantic Sec.) F. L. Rimbach, Chairman, Rural Electrification Comm.; O. B. Stichter, Secy. Next meeting at New Brunswick, N. J. Date to be announced later.